Vol. 1098 Number 2

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

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Patent
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Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 10, 1989 Volume 1098 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

226-861 O.G.-89-1

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Oct. 26, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct.

5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 7, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,562,596 through 4,563,775
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 5, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,308,622 through 4,309,773
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 23, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,477,933	06/497,054	10/23/84
4,477,935	06/338,040	10/23/84
4,477,936	06/457,932	10/23/84
4,477,937	06/498,854	10/23/84
4,477,943	06/497,294	10/23/84
4,477,953	06/280,924	10/23/84
4,477,954	06/469,525	10/23/84
4,477,956	06/458,730	10/23/84
4,477,958	06/269,286	10/23/84
4,477,967	06/525,792	10/23/84
4,477,974	06/377,363	10/23/84
4,477,977	06/433,555	10/23/84
4,477,979	06/457,561	10/23/84
4,477,980	06/492,170	10/23/84
4,477,981	06/503,387	10/23/84
4,477,983	06/311,463	10/23/84
4,477,985	06/384,733	10/23/84
4,477,989	06/503,862	10/23/84
4,477,990	06/386,219	10/23/84
4,477,992	06/346,901	10/23/84
4,477,997	06/466,920	10/23/84
4,477,998	06/499,454	10/23/84
4,477,999	06/528,476	10/23/84
4,478,001	06/275,571	10/23/84
4,478,002	06/430,347	10/23/84
4,478,003	06/344,635	10/23/84
4,478,015	06/414,968	10/23/84
4,478,017	06/479,721	10/23/84
4,478,019	06/311,633	10/23/84
4,478,025	06/297,860	10/23/84
4,478,030	06/301,723	10/23/84
4,478,037	06/399,127	10/23/84
4,478,040	06/425,609	10/23/84
4,478,046	06/486,307	10/23/84
4,478,052	06/535,222	10/23/84
4,478,057	06/521,707	10/23/84
4,478,059	06/530,908	10/23/84
4,478,064	06/355,090	10/23/84
4,478,079	06/494,209	10/23/84
4,478,091	06/407,174	10/23/84
4,478,092	06/468,857	10/23/84
4,478,093	06/472,447	10/23/84
4,478,097	06/233,939	10/23/84
4,478,113	06/373,888	10/23/84
4,478,114	06/426,672	10/23/84
4,478,127	06/422,045	10/23/84
4,478,128	06/262,351	10/23/84
4,478,132	06/505,062	10/23/84
4,478,135	06/424,396	10/23/84
4,478,136	06/405,094	10/23/84
4,478,138	06/431,699	10/23/84
4,478,142	06/571,381	10/23/84
4,478,147	06/463,178	10/23/84
4,478,158	06/490,221	10/23/84
4,478,163	06/426,145	10/23/84
4,478,168	06/401,230	10/23/84
4,478,172	06/560,390	10/23/84
4,478,175	06/550,982	10/23/84
4,478,176	06/421,433	10/23/84
4,478,178	06/493,814	10/23/84
4,478,188	06/362,373	10/23/84

Patent Number	Serial Number	Issue Date
4,478,204	06/462,226	10/23/84
4,478,206	06/568,382	10/23/84
4,478,216	06/368,024	10/23/84
4,478,219	06/361,386	10/23/84
4,478,223	06/447,155	10/23/84
4,478,227	06/398,920	10/23/84
4,478,228	06/431,470	10/23/84
4,478,231	06/279,567	10/23/84
4,478,233	06/460,156	10/23/84
4,478,234	06/373,657	10/23/84
4,478,240	06/373,973	10/23/84
4,478,244	06/455,809	10/23/84
4,478,246	06/291,515	10/23/84
4,478,247	06/342,394	10/23/84
4,478,253	06/483,404	10/23/84
4,478,254	06/335,254	10/23/84
4,478,255	06/493,979	10/23/84
4,478,264	06/407,258	10/23/84
4,478,265	06/459,259	10/23/84
4,478,273	06/495,007	10/23/84
4,478,276	06/316,067	10/23/84
4,478,278	06/325,534	10/23/84
4,478,287	06/461,645	10/23/84
4,478,295	06/422,592	10/23/84
4,478,303	06/382,155	10/23/84
4,478,305	06/423,643	10/23/84
4,478,308	06/465,332	10/23/84
4,478,314	06/412,472	10/23/84
4,478,318	06/378,131	10/23/84
4,478,324	06/368,265	10/23/84
4,478,329	06/368,911	10/23/84
4,478,330	06/536,280	10/23/84
4,478,331	06/393,513	10/23/84
4,478,349	06/220,192	10/23/84
4,478,355	06/371,217	10/23/84
4,478,366	06/513,626	10/23/84
4,478,369	06/462,884	10/23/84
4,478,408	06/331,611	10/23/84
4,478,414	06/470,058	10/23/84
4,478,415	06/397,827	10/23/84
4,478,417	06/481,474	10/23/84
4,478,418	06/345,051	10/23/84
4,478,420	06/472,072	10/23/84
4,478,422	06/481,598	10/23/84
4,478,425	06/435,563	10/23/84
4,478,426	06/395,625	10/23/84
4,478,444	06/445,553	10/23/84
4,478,453	06/344,366	10/23/84
4,478,457	06/489,716	10/23/84
4,478,458	06/438,589	10/23/84
4,478,460	06/416,074	10/23/84
4,478,464	06/325,654	10/23/84
4,478,468	06/412,156	10/23/84
4,478,469	06/378,538	10/23/84
4,478,473	06/431,969	10/23/84
4,478,474	06/431,970	10/23/84
4,478,484	06/328,891	10/23/84
4,478,513	06/349,702	10/23/84
4,478,519	06/359,768	10/23/84
4,478,521	06/319,697	10/23/84
4,478,532	06/489,585	10/23/84
4,478,536	06/486,184	10/23/84
4,478,548	06/293,318	10/23/84
4,478,552	06/439,914	10/23/84
4,478,553	06/363,156	10/23/84
4,478,557	06/470,669	10/23/84
4,478,560	06/422,094	10/23/84
4,478,574	06/410,890	10/23/84
4,478,575	06/510,262	10/23/84
4,478,576	06/503,623	10/23/84
4,478,577	06/521,721	10/23/84
4,478,579	06/362,738	10/23/84
4,478,593	06/271,439	10/23/84
4,478,601	06/456,107	10/23/84
4,478,607	06/519,803	10/23/84
4,478,630	06/472,299	10/23/84
4,478,634	06/510,008	10/23/84
4,478,644	06/486,163	10/23/84
4,478,648	06/481,770	10/23/84
4,478,651	06/538,252	10/23/84
4,478,652	06/396,702	10/23/84
4,478,654	06/337,628	10/23/84
4,478,662	06/442,477	10/23/84
4,478,664	06/505,791	10/23/84
4,478,666	06/426,068	10/23/84
4,478,670	06/441,226	10/23/84
4,478,671	06/475,733	10/23/84
4,478,672	06/398,533	10/23/84
4,478,673	06/436,965	10/23/84
4,478,676	06/415,764	10/23/84
4,478,680	06/471,459	10/23/84
4,478,684	06/512,755	10/23/84
4,478,685	06/320,198	10/23/84
4,478,686	06/311,340	10/23/84
4,478,699	06/256,399	10/23/84
4,478,714	06/456,871	10/23/84
4,478,723	06/383,692	10/23/84
4,478,725	06/476,574	10/23/84
4,478,726	06/436,740	10/23/84
4,478,731	06/516,182	10/23/84
4,478,736	06/457,930	10/23/84
4,478,739	06/508,615	10/23/84
4,478,750	06/385,867	10/23/84
4,478,756	06/431,459	10/23/84
4,478,781	06/412,912	10/23/84
4,478,783	06/327,830	10/23/84
4,478,790	06/373,827	10/23/84
4,478,794	06/471,709	10/23/84
4,478,797	06/422,145	10/23/84
4,478,823	06/456,976	10/23/84
4,478,831	06/376,904	10/23/84
4,478,835	06/519,707	10/23/84
4,478,838	06/441,635	10/23/84
4,478,839	06/416,670	10/23/84
4,478,841	06/374,364	10/23/84
4,478,843	06/318,153	10/23/84
4,478,848	06/404,087	10/23/84
4,478,857	06/479,258	10/23/84
4,478,874	06/559,665	10/23/84
4,478,877	06/432,376	10/23/84
4,478,878	06/410,478	10/23/84
4,478,882	06/384,499	10/23/84
4,478,920	06/484,688	10/23/84
4,478,970	06/564,479	10/23/84
4,478,971	06/512,080	10/23/84
4,479,006	06/554,382	10/23/84
4,479,019	06/582,083	10/23/84
4,479,023	06/559,328	10/23/84
4,479,030	06/398,346	10/23/84
4,479,038	06/446,508	10/23/84
4,479,048	06/474,127	10/23/84
4,479,053	06/242,797	10/23/84
4,479,064	06/480,764	10/23/84
4,479,079	06/544,255	10/23/84
4,479,081	06/494,350	10/23/84
4,479,089	06/318,365	10/23/84
4,479,093	06/327,075	10/23/84
4,479,109	06/385,873	10/23/84
4,479,110	06/340,263	10/23/84
4,479,114	06/423,666	10/23/84
4,479,136	06/467,422	10/23/84
4,479,145	06/400,681	10/23/84
4,479,160	06/490,697	10/23/84
4,479,169	06/377,960	10/23/84
4,479,170	06/493,069	10/23/84
4,479,171	06/526,458	10/23/84
4,479,181	06/299,074	10/23/84
4,479,188	06/411,241	10/23/84
4,479,190	06/329,576	10/23/84
4,479,203	06/321,855	10/23/84
4,479,207	06/359,794	10/23/84
4,479,215	06/422,777	10/23/84
4,479,222	06/372,364	10/23/84
4,479,227	06/414,186	10/23/84
4,479,240	06/306,689	10/23/84
4,479,245	06/451,678	10/23/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,349,120	06/272,301	9/14/82	6/10/81	11/29/88
4,457,503	06/356,795	7/3/84	3/10/82	12/9/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,460,750 Re. S.N. 267,548, Filed Nov. 4, 1988, Cl. 525/333.8, PROCESS FOR THE TREATMENT OF LOW DENSITY POLYETHYLENE BY ORGANIC PEROXIDES WHICH GENERATE FREE RADICALS, Jean-Paul Thiersault, et al., Owner of Record: *B.P. Chemical Ltd., London, England,* Attorney or Agent: Harold Haidt, Ex. Gp.: 155

4,589,053, Re. S.N. 193,731, Filed Nov. 29, 1988, Cl. 361/213, METHOD AND DEVICE FOR CHARGING OR DISCHARGING A MEMBER, Nagao Hosono, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David M. Quinlan, Ex. Gp.: 214

4,605,938, Re. S.N. 232,110, Filed Aug. 12, 1988, Cl. 346/76PH, THERMAL TRANSFER RECORDING APPARATUS, Jyunichi Matsuno, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Gregory E. Montone, Ex. Gp.: 216

4,612,884, Re. S.N. 248,995, Filed Sept. 23, 1988, Cl. 123/90.16, VALVE OPERATING AND INTERRUPTING MECHANISM FOR INTERNAL COMBUSTION ENGINE, Yoshio Ajiki, et al., Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Conrad R. Slocum, Jr., Ex. Gp.: 346

4,713,243, Re. S.N. 272,354, Filed Nov. 16, 1988, Cl. 424/151, BIOADHESIVE EXTRIDED FILM FOR INTRA-ORAL DRUG DELIVERY AND PROCESS, Michael T. Schiraldi, Owner of Record: *Johnson & Johnson Products, Inc., New Brunswick, N.J.* Attorney or Agent: Joseph J. Brindisi, Ex. Gp.: 125

4,729,805, Re. S.N. 265,905, Filed Nov. 1, 1988, Cl. 156/160, RECORDING MEDIUM ANNEALING PROCESS, Jerry L. Alexander, et al., Owner of Record: *Inventors,* Attorney or Agent: Douglas B. Little, Ex. Gp.: 131

4,741,251, Re. S.N. 272,067, Filed Nov. 15, 1988, Cl. 92/57, SWASHPLATE ASSEMBLY FOR A SWASHPLATE TYPE HYDRAULIC PRESSURE DEVICE, Isytomu Hayashi, et al., Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: John D. McConaghy, Ex. Gp.: 341

4,763,291, Re. S.N. 272,950, Filed Nov. 18, 1988, Cl. 364/704, REMOTE DISPLAY DEVICE FOR A MICROCOMPUTER, Jeffrey G. Schwaber, Owner of Record: *Project Bemjamin, Ltd., Winter Park, Fla.,* Attorney or Agent: James H. Beusse, Ex. Gp.: 131

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,872,462, Reexam. No. 90/001,652, Requested: Nov. 29, 1988, Cl. 360/324, FORM FILLING SYSTEM AND METHOD, Jerome H. Lemelson, Owner of Record: *Inventor, Princeton, N.J.,* Attorney or Agent: None, Ex. Gp.: 260, Requester: Epson America Inc., Torrance, Calif.

4,391,705, Reexam. No. 90/001,650, Requested: Nov. 26, 1988, Cl. 210/218, BALLASTING DIGESTOR COVERS, Lyn W. Cook, et al., Owner of Record: *Envirotech Corp., Salt Lake City, Ut.,* Attorney or Agent: R. E. Krebs, Ex. Gp.: 130, Requester: Westech Engineering Inc., Salt Lake City, Ut.

4,468,702, Reexam. No. 90/001,649, Requested: Nov. 29, 1988, Cl. 358/245, RADIATION AND STATIC ELECTRICITY SUPPRESSION DEVICE, Louis Jandrell, Owner of Record: *Daca International, B.V., Sligo, Ireland,* Attorney or Agent: Albert J. Hillman, Ex. Gp.: 260, Requester: Kerkam, Stowell, Kondracki & Clarke, Falls Church, Va.,

4,559,382, Reexam. No. 90/001,651, Requested: Nov. 28, 1988, Cl. 524/535, PROCESSABLE RADIATION CURABLE POLY (VINYL CHLORIDE) RESIN COMPOSITIONS, John A. Martens, et al., Owner of Record: *Minnesota Mining & Manufacturing Co., St. Paul, Minn.,* Attorney or Agent: David Weinstein, Ex. Gp.: 150, Requester: Owner

4,611,104, Reexam. No. 90/001,653, Requested: Nov. 29, 1988, Cl. 200/43.80, ELECTROMECHANICAL SWITCH ACTUATOR HAVING HIGH SECURITY KEY ACTUATOR, Redreddy S. Reddy, Owner of Record: *Vapor Corp., Chicago, Ill.,* Attorney or Agent: John F. Flannery, Ex. Gp.: 240, Requester: Owner

4,651,513, Reexam. No. 90/001,654, Requested: Dec. 1, 1988, Cl. 57/217, LAYERED STEEL CORD, Paul Dambre, Owner of Record: *N.V. Bekaert S.A., Zwevegem, Belgium,* Attorney or Agent: Arthur Schwartz, Ex. Gp.: 240, Requester: Owner

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, GE Appliances, General Electric Co., Appliance Park 2-226, Louisville, Ky. 40225.

4,197,717. HOUSEHOLD REFRIGERATOR INCLUDING A VACATION SWITCH.
4,296,299. APPARATUS FOR THAWING FROZEN FOOD IN A REFRIGERATION APPLIANCE.
4,303,820. CAPACITATIVE APPARATUS FOR THAWING FROZEN FOOD IN A REFRIGERATION APPLIANCE.
4,422,129. HUMIDITY SENSOR.
4,429,544. REFRIGERANT STORAGE SYSTEM FOR A HEAT PUMP.
4,429,578. ACOUSTICAL DEFECT DETECTION SYSTEM.
4,463,348. REFRIGERATOR DOOR USAGE MONITOR AND DISPLAY SYSTEM.
4,534,179. AIR CONDITIONING DEVICE.
4,543,799. HOUSEHOLD REFRIGERATOR WITH AIR CIRCULATING AND COOLING ARRANGEMENT.
4,606,112. REFRIGERATOR CABINET AND METHOD OF ASSEMBLY.
4,704,237. VACUUM FORMING PROCESS FOR ARTICLES HAVING HIGH FORMING STRESSES.
4,706,363. METHOD OF REINFORCING A STRUCTURAL ASSEMBLY.
4,722,018. BLOCKED CONDENSER AIRFLOW PROTECTION FOR REFRIGERATION SYSTEMS.
4,722,019. PROTECTION METHODS AND SYSTEMS FOR REFRIGERATION SYSTEMS SUITABLE FOR A VARIETY OF DIFFERENT MODELS.
4,724,678. SELF-CALIBRATING CONTROL METHODS AND SYSTEMS FOR REFRIGERATION SYSTEMS.
4,727,320. METHOD AND APPARATUS FOR MOTOR SIZE DETERMINATION.
4,737,616. POWER CONTROL FOR COOKING APPLIANCE WITH TRANSIENT OPERATING MODES.
4,755,655. THERMAL PROTECTION ARRANGEMENT FOR SOLID DISK GLASS COOKTOP.

Simon J. Hoffman offers to license or sell each of the following patents on reasonable terms. Inquiries should be directed to John K. McCulloch at 5291 Colony Dr. N., Saginaw, Mich. 48603.

3,750,283. BLADE ATTACHMENT MEANS FOR SABER SAW ASSEMBLY.
3,823,473. BLADE ATTACHMENT MEANS FOR SABER SAW ASSEMBLY.
3,901,117. SABER SAW AND BLADE THEREFOR.
4,204,692. BLADE HOLDER FOR SABER SAW.
4,285,129. HOLDER FOR SABER SAW BLADE.
4,299,402. BLADE HOLDER FOR SABER SAW.
4,470,196. HOLDER FOR SABER SAW BLADE.
4,594,781. HOLDER FOR SABER SAW BLADE.
4,648,182. HOLDER FOR SABER SAW BLADE.

4,135,596. HOSE TRAY FOR LIQUID TRANSPORTER. *Glen R. Silba,* R.R. 7, Box 357A, Springfield, Mo. 65802.
4,185,407. DISPLAY DEVICE ELECTRIC OR BATTERY RUN. *Jack W. Lamb.* 10822 Magnolia Blvd., North Hollywood, Calif. 91601.
4,491,212. PICKERS AID. *Frank L. Gray,* P.O. Box 2950, Gary, Ind. 46403.
4,505,902. SKIN TREATMENT PREPARATION. *Mary Alice Millare,* 2068 Belover Dr., Memphis, Tenn. 38127.
4,576,178. AUDIO SIGNAL GENERATOR. *Guy W. Shoup,* Wyatt, Gerber, Shoup & Badie, One Rockefeller Plaza, New York, N.Y. 10020.
4,702,704. TETRAHEDRAL CODON STERO-TABLE. *Leonard R. Svensson,* Birch, Stewart, Kolasch & Birch, P.O. Box 747, Falls Church, Va. 22046.
4,765,618. TENNIS TABLE ROBOT. *Peter R. Bahn,* 744 New Britain Ave., Farmington, Conn. 06032.
4,767,511. CHLORINATION AND PH CONTROL SYSTEM. *Pedro Aragon,* 306 Highpoint Dr., Wadsworth, Ohio 44281.
07/185,131. BEVEL-SPLINED COMPONENT. *Stanley Walker,* Rte. 4 Box 13, Eureka Springs, Ariz. 72632.
07/158,398. ELECTRONIC DIGITAL DICE I, ELECTRONIC DIGITAL DICE II. *Glenn E. Simpson,* 204 N. 3rd St., Libertyville, Ill. 60048.
07/238,519. FRAME A 'SPECIAL' CARD. *Dorothy M. Smith,* 5828 Vandergrift Ave., Rockville, Md. 20851.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of March 22, 1988, was listed inadvertently:

1,481,522	TM 159	Mar. 22, 1988

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Dec. 12, 1988. *Administrator for Trademark Operations.*

Service by Publication

A petition to cancel the registrations below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notrice is hereby given that unless the registrant listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Tri-State Engineering Co., Washington, Pa., Reg. No. 512,417 for the mark "CARGOTAINER," Canc. No. 17,017.

PBI Industries, Rochester, Pa., Reg. No. 929,408 for the mark "PBI INDUSTRIES," Canc. No. 17,046.

Sport's of America, Inc., Reno, Nev., Reg. No. 1,219,509 for the mark "SPORT'S" and design, Canc. No. 17,260.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner for Trademarks.

Survey of Registered Practitioners In Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1988 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with K through O. Enclosed with the letter was a data sheet which had to be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey let-

ter will result in the practitioner being removed from the register in accordance with CFR 10.11(b).

If your last name begins with K through O and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

Dec. 12, 1988.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 10, 1989

P.P. 5,212	4,723,193	4,750,017	4,762,449
P.P. 5,215	4,724,520	4,750,050	4,762,744
P.P. 5,862	4,726,571	4,750,090	4,762,924
D. 293,570	4,726,854	4,750,175	4,763,345
D. 297,124	4,726,924	4,750,614	4,763,443
4,225,607	4,727,153	4,750,787	4,763,453
4,518,613	4,727,781	4,750,847	4,763,562
4,521,272	4,727,930	4,751,719	4,763,769
4,531,959	4,728,858	4,751,774	4,763,784
4,533,529	4,729,583	4,752,024	4,763,934
4,538,527	4,729,697	4,752,258	4,764,030
4,552,645	4,730,597	4,752,642	4,764,576
4,567,411	4,731,285	4,752,685	4,764,761
4,569,906	4,731,654	4,752,707	4,764,942
4,572,515	4,731,771	4,752,747	4,764,976
4,586,801	4,733,065	4,753,474	4,765,344
4,598,349	4,733,219	4,753,911	4,765,543
4,614,112	4,733,747	4,753,936	4,765,667
4,626,006	4,734,225	4,754,190	4,765,766
4,628,476	4,734,348	4,754,477	4,765,843
4,639,273	4,734,453	4,755,386	4,765,910
4,654,362	4,734,847	4,755,977	4,765,958
4,656,520	4,735,701	4,756,175	4,766,316
4,665,979	4,736,029	4,756,650	4,766,446
4,673,753	4,737,604	4,757,071	4,766,553
4,674,856	4,738,413	4,757,289	4,766,676
4,681,790	4,738,646	4,757,605	4,766,928
4,688,900	4,738,657	4,758,222	4,767,198
4,690,142	4,741,078	4,758,369	4,767,215
4,695,569	4,741,562	4,758,581	4,768,294
4,696,597	4,741,727	4,759,203	4,768,627
4,697,028	4,742,973	4,759,910	4,768,696
4,699,013	4,743,208	4,759,929	4,768,918
4,702,256	4,743,252	4,760,096	4,770,440
4,703,287	4,743,886	4,760,252	4,770,780
4,703,416	4,743,968	4,760,329	4,772,483
4,705,558	4,744,827	4,760,540	4,772,800
4,705,786	4,744,873	4,760,596	4,773,032
4,708,356	4,745,206	4,760,937	4,733,401
4,708,770	4,745,608	4,761,257	4,774,630
4,709,033	4,745,836	4,761,281	4,744,675
4,712,968	4,746,688	4,761,284	4,776,266
4,716,763	4,747,608	4,761,312	4,776,680
4,717,323	4,748,236	4,762,007	4,783,624
4,718,056	4,748,519	4,762,243	
4,721,763	4,749,518	4,762,260	

Disclaimers

4,509,113.—*Chester A. Heath,* Boca Raton, Fla. PERIPHERAL INTERFACE ADAPTER CIRCUIT FOR USE IN I/O CONTROLLER CARD HAVING MULTIPLE MODES OF OPERATION. Patent dated Apr. 2, 1985. Disclaimer filed Nov. 4, 1988, by the assignee, *International Business Machines Corp.*

The term of this patent subsequent to May 29, 2001, has been disclaimed.

4,555,007.—*Richard F. Harrington,* Lincolnwood; *Richard T. Dagiel,* Elk Grove Village; and *Villy Brown,* Chicago, all of Ill. SELF ADJUSTING THRUST, LOW ANGULAR CONTACT BEARING. Patent dated Nov. 26, 1985. Disclaimer filed Nov. 30, 1987, by the assignee, *Aetna Bearing Co.*

Hereby enters this disclaimer to claims 1–7 of said patent.

4,624,544.—*Lothar S. Jeromin,* Sierra Madre, Calif. AUTOMATIC XEROGRAPHIC PLATE DEVELOPMENT SYSTEM. Patent dated Nov. 25, 1986. Disclaimer filed Oct. 31, 1988, by the assignee, *Xerox Corp.*

Hereby enter this disclaimer to claim 2 of said patent.

4,783,705.—*Ronald R. Moon,* Santa Clara; *Michael G. Machado,* San Jose; *Thomas G. Cooper,* Palo Alto; *Patrick M. Weiher,* Los Altos; *Curtis H. Bruner,* Los Gatos; *Mark E. Strysko,* Sunnyvale; *Gregg J. Uhlendorf,* San Jose; *Steven G. Campbell,* San Jose; *Toung T. Quan,* San Jose; *Hoa V. Luong,* Milpitas, all of Calif. Patent dated Nov. 8, 1988. Disclaimer filed Oct. 20, 1988, by the assignee, *Quantum Corp.*

The term of this patent subsequent to May 26, 2004, has been disclaimed.

Disclaimers and Dedications

4,705,951.—*Frederick P. Layman,* Fremont; *David A. Huntley,* Mountain View; *Paul H. Dick,* San Jose; *George L. Coad,* Lafayette; *Michael J. Kuhlman,* Fremont; *Roger M. Vecta,* San Jose; *Phillip M. Hobson,* Los Altos, all of Calif. WAFER PROCESSING SYSTEM. Patent dated Nov. 10, 1987. Disclaimer and Dedication filed Sept. 28, 1988, by the assignee, *Varian Associates, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

4,713,551.
Frederick P. Layman and *Michael J. Kuhlman,* both of Fremont, Calif. SYSTEM FOR MEASURING THE POSITION OF A WAFER IN A CASSETTE. Patent dated Dec. 15, 1987. Disclaimer and Dedication filed Sept. 28, 1988, by the assignee, *Varian Associates, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

4,764,076.—*Frederick P. Layman,* Fremont; *Phillip M. Hobson,* Los Altos; and *Paul H. Dick,* San Jose, all of Calif. VALVE INCORPORATING WAFER HANDLING ARM. Patent dated Aug. 16, 1988. Disclaimer and Dedication filed Sept. 28, 1988, by the assignee, *Varian Associates, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

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Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 3, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-4-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	1-17-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	1-20-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
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MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-10-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	6-19-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-7-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-4-88

Expiration of patents: The patents within the range of numbers indicated below expire during December 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,624,839 to 3,631,538, inclusive

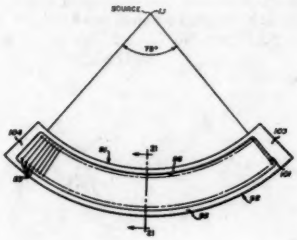
Plant Patents ..... None

REEXAMINATIONS

JANUARY 10, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,075,491 (988th)
POSITION SENSITIVE X-RAY OR γ-RAY DETECTOR AND 3-D TOMOGRAPHY USING SAME
Douglas P. Boyd, Palo Alto, Calif., assignor to The Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.
Reexamination Request No. 90/001,333, Sep. 21, 1987.
Reexamination Certificate for Patent No. 4,075,491, issued Feb. 21, 1978, Ser. No. 738,630, Nov. 3, 1976.
Continuation of Ser. No. 528,025, Nov. 29, 1974, abandoned.
Int. Cl.⁴ A61B *6/02;* **G01N** *23/04;* **G01T** *1/18;* **H01J** *47/06*
U.S. Cl. 378—19



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 9, 14** and **19** are determined to be patentable as amended.

Claims **2–8, 10–13, 15–18** and **20–23**, dependent on an amended claim, are determined to be patentable.

New claims **24–27** are added and determined to be patentable.

1. [A] *For use in X-ray computed tomography, a* position-sensitive detector for detecting *continuous* divergent rays of penetrating radiation transmitted from [a] *an X-ray point* source of penetrating radiation through an object [being examined] *to be imaged*, said detector comprising:

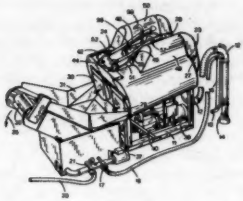
a detector housing;

anode and cathode electrode means spaced apart to define a gap therebetween within said housing, said housing adapted to receive an ionizable gaseous medium disposed in the space between said anode and cathode electrode means; [and]

at least one of said spaced apart anode or cathode electrode means including a divergent array of spaced apart elongated electrically conductive [electrode portions] *electrodes* defining a divergent array of elongated detector gaps therebetween, such elongated [electrode portions] *electrodes* being elongated along radial lines with a common center at a point in space corresponding to the position of the *point* source of penetrating radiation *with said electrodes being parallel to radiation emitted by the X-ray point source of penetrating radiation; and*

a plurality of separate signal detection means each individually connected to a respective one of said electrodes for simultaneously detecting a signal from each of said electrodes.

B1 4,517,099 (989th)
APPARATUS AND METHOD FOR HANDLING SOLIDS IN LIQUID
Raymond A. Breckner, 11360 Granville Ave., Richmond, British Columbia, Canada (V6Y 1R6)
Reexamination Request No. 90/001,390, Dec. 4, 1987.
Reexamination Certificate for Patent No. 4,517,099, issued May 14, 1985, Ser. No. 540,166, Oct. 7, 1983.
Int. Cl.⁴ B01D *21/24*
U.S. Cl. 210—741



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. An apparatus for handling a solid/liquid mixture comprising solids carried in a liquid, the apparatus having a receiving chamber adapted to receive the mixture from a delivery duct and to hold the mixture temporarily, the chamber communicating with a low air pressure source or vacuum source through a main directional valve, the chamber having an inlet valve communicating with the delivery duct to receive the mixture, an outlet valve to discharge the mixture from the chamber, an admitting valve to raise pressure in the chamber, and a quantity sensing means responsive to a predetermined quantity of mixture within the chamber, the apparatus being characterized by:

(a) the inlet valve being positioned adjacent an upper portion of the chamber above a maximum upper level of mixture within the chamber, and the chamber being connectable, as required, to the low pressure source to expose the inlet valve to a pressure difference so as to open the inlet valve and to draw the mixture therethrough,

(b) a riser means positioned upstream of the inlet valve and adapted to receive and to constrain the mixture to move initially upwardly prior to discharging through the inlet valve into the chamber, the riser means being shaped so as to cause solids, that might other wise tend to rest adjacent the inlet valve when the mixture flow therethrough ceases, to fall under gravity either forwardly through the inlet valve and into the chamber, or backwardly towards the mixture within the delivery duct,

(c) time delay means responsive to the quantity sensing means to actuate the main directional valve when the predetermined quantity is attached to disconnect the vacuum source from the chamber, while concurrently permitting the mixture to continue to flow through the inlet valve under a gradually reducing pressure difference, so that flow through the inlet valve eventually ceases at a time when the maximum upper level is attained, prior to opening of the admitting valve to raise pressure in the chamber which closes the inlet valve, so as to provide

time for solids to clear the inlet valve before closure thereof.

11. A method of handling a solid/liquid mixture comprising solids carried in a liquid, in which the mixture is temporarily stored within a receiving chamber having an inlet valve to receive the mixture, an outlet valve to discharge the mixture, an admitting valve to raise pressure in the chamber, and a quantity sensing means responsive to a predetermined quantity of mixture within the chamber, the method including steps of:

(a) positioning the inlet valve adjacent an upper portion of the chamber above a maximum upper level of mixture within the chamber,

(b) exposing the chamber to a vacuum source to generate a pressure difference across the inlet valve to cause the mixture to flow into the chamber, and concurrently constraining the flow of mixture by a riser means which causes the mixture to move upwardly prior to entering the inlet valve and discharging into the chamber,

(c) sensing when the amount of mixture within the chamber attains the predetermined quantity, and disconnecting the vacuum source from the chamber while permitting continuation of the flow of mixture into the chamber so that the continuing flow gradually decreases the pressure difference across the inlet valve, so that flow of mixture through the inlet valve eventually ceases at a time when a maximum upper level of mixture within the chamber is below the inlet valve,

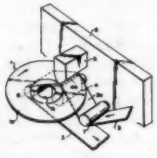
(d) opening the admitting valve sometime after disconnecting the vacuum source to provide a time delay sufficient to permit any solids coming to rest adjacent the inlet valve, when the mixture flow therethrough ceases, to fall under gravity either forwardly through the inlet valve and into the chamber, or backwardly towards the mixture within the delivery duct, so as to raise pressure in the chamber to permit the inlet valve to close and the outlet valve to open to discharge the mixture from the chamber.

B1 4,656,790 (990th)

BURNISHING METHOD AND APPARATUS FOR MAGNETIC DISK

Kazuo Mukai; Akira Hosjoh, both of Tokyo, and Shuji Nakata, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Reexamination Request No. 90/001,433, Jan. 29, 1988.
Reexamination Certificate for Patent No. 4,656,790, issued Apr. 14, 1987, Ser. No. 801,762, Nov. 26, 1985.
Claims priority, application Japan, Dec. 4, 1984, 59-256290
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—141



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 3 are determined to be patentable as amended.

Claims 2 and 4, dependent on an amended claim, are determined to be patentable.

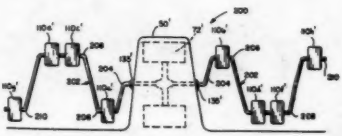
1. A method of burnishing a surface of a magnetic disk by use of an abrasive tape, which comprises the steps of: rotating said magnetic disk, jetting compressed air via [opposed air nozzles to the same positions on the two surfaces] *a first air nozzle directly against one surface of the magnetic disk and via a second air nozzle on the opposite side of the disk toward a corresponding position on the opposite side surface* of said magnetic disk, intervening said abrasive tape between [one of said air nozzles] *the second air nozzle* and *the opposite* one of said surfaces of said magnetic disk, and closely contacting said abrasive tape with the [magnetic material] *opposite side* surface of said magnetic disk and thereby conducting the burnishing *under controlled contact pressure condition, the second air nozzle providing an unimpeded air flow from the nozzle to the abrasive tape.*

B1 4,668,196 (991st)

MANUALLY POWERED BOAT

Charles E. Billmayer, and Robert P. Koch, both of Grand Rapids, Mich., assignors to Leisure Life Limited, Grand Rapids, Mich.

Reexamination Request No. 90/001,498, Apr. 21, 1988.
Reexamination Certificate for Patent No. 4,668,196, issued May 26, 1987, Ser. No. 833,348, Feb. 25, 1986.
Int. Cl.[4] B63H *5/02*
U.S. Cl. 440—26



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 8, 13, 19, 22 and 33 is confirmed.

Claims 1–7, 9–12, 14–18, 20, 21 and 23–32 are cancelled.

New claim 34 is added and determined to be patentable.

13. The boat of claim 1 wherein said means for rotatably mounting said propulsion means include bearing means mounted on said hull means; said bearing means including shaft engaging surface means extending through said hull means, flange means extending over at least a portion of said manual crank means for protecting said manual crank means against water from said propulsion means, and fastener means extending through said hull means for securing said bearing means thereon.

34. A manually powered boat comprising:

a buoyant hull means for floating said boat on water, said hull means having a longitudinal center line, extending therealong;

seat means for supporting at least three persons transversely across the width of said boat;

propulsion means for engaging the water for propelling said boat through the water;

means for rotatably mounting said propulsion means on said hull means;

manual crank means extending to either side of said center line and connected to said propulsion means for rotating said propulsion means to propel said boat; support means for supporting said manual crank means; said manual crank means having an axis of rotation and including extending portions having at least three extremity engaging areas on each side of said center line which are offset from said axis of rotation; the first of said areas on each side of said center line being closest to and immediately adjacent said center line and being offset across said axis of rotation from one another; said

first areas each including first extremity engaging means for receiving an operator's extremity to operate said manual crank means and propulsion means; said second extremity engaging areas on each side of said center line including second extremity engaging means for engagement by adjacent extremities of at least two operators who are seated immediately adjacent and side-by-side one another on said seat means such that their adjacent extremities will be moved in unison during operation of said boat; the third extremity engaging areas on each side of said center line including third extremity engaging means for receiving an extremity of an operator different from the operator of said first area on each side to operate said manual crank means and propulsion means; said second and third areas on each side of said center line being spaced successively from said center line outwardly of said first area; said second extremity receiving areas being offset oppositely across said axis of rotation from said first and third areas on each side of said center line.

REISSUES

JANUARY 10, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,822

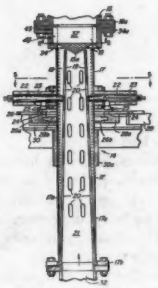
POTATO STRIP CUTTER

Joseph L. Hodges, and Glen R. Green, both of P.O. Box 10, Ontario, Oreg. 97914

Original No. 4,082,024, dated Apr. 4, 1978, Ser. No. 745,537, Nov. 29, 1976. Application for reissue Sep. 24, 1979, Ser. No. 77,945

Int. Cl.[4] B26D *7/06, 3/26*

U.S. Cl. 83—402 **15 Claims**



14. In an apparatus for cutting items as potatoes into strips, which apparatus comprises convergent conduit means followed by elongate conduit means followed by knife conduit means, means for hydraulically feeding said items to be cut into said convergent conduit means, and a strip cutting knife device in said knife conduit means, the combination therewith of a mechanism in said elongate conduit means for positioning said items in the hydraulic flow path for movement into said cutting knife device, said mechanism comprising a series of elongate walls internally of said elongate conduit means and peripheral to the flow passage therethrough each of said walls beings hingedly connected to the elongate conduit means at the upstream end of the wall but otherwise free along its length to move toward and away from the longitudinal axis of the elongate conduit means; means normally maintaining said walls at respective extreme positions of inward swing to define a flow passage of minimum cross-sectional area through the elongate conduit means; means for simultaneously and equivalently moving all of said walls outwardly to provide a flow passage of increased cross-sectional area through the elongate conduit means, when an item, which is being hydraulically carried through the elongate conduit means impacts against one or more of said walls; and passages in said walls permitting flow of hydraulic fluid to substantially equalize hydraulic pressure against said walls so they are not forced to increased cross-sectional area under hydraulic flow pressure.

Re. 32,823

APPARATUS AND METHOD FOR SEGREGATING PARTS

Larry C. Dahlby, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Original No. 4,676,380, dated Jun. 30, 1987, Ser. No. 821,661, Jan. 23, 1986. Application for reissue Jan. 27, 1988, Ser. No. 149,047

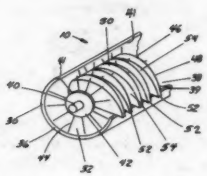
Int. Cl.[4] B07C *5/04, 5/36*

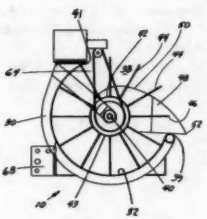
U.S. Cl. 209—616 **21 Claims**

20. A device for segregating parts of predetermined dimensions from a jumbled flow of such parts and unwanted pieces longer than said predetermined dimensions, comprising:

path means, including a chute having a cylindrical inside surface defining a lateral opening therethrough, for restricting the jumbled flow to a fixed flow space along a flow length, the cylindrical surface defining the fixed flow space;

a three-dimensional array of pickup fingers substantially filling the fixed flow space and extending therebeyond, said fingers spaced apart by distances greater than the predetermined dimensions of the parts, the distal portions of the fingers being so disposed in the chute as to contact both the parts and the unwanted pieces passing therethrough;





means to continuously move successive distal portions of the pickup finger array out of and into the fixed flow space, for selectively picking up and removing the unwanted pieces from the cylindrical inside surface of the chute; and

stationary means between the fingers and extending from the fixed flow space laterally to a position adjacent thereto, for receiving the unwanted pieces from the pickup-finger array thereby stripping the unwanted pieces from said fingers during pickup-finger array movement, the stationary stripping means extending through the cylindrical surface lateral opening.

Re. 32,824

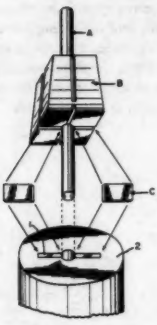
PRE-MADE REINFORCEMENT DEVICE

Geoffrey C. Bushway, Virginia Beach, Va., assignor to Advanced Dental Technology, Inc., Las Vegas, Nev.

Original No. 4,543,065, dated Sep. 24, 1985, Ser. No. 556,911, Dec. 1, 1983. Application for reissue Feb. 4, 1986, Ser. No. 825,989

Int. Cl.[4] A61C 5/08

U.S. Cl. 433—221 32 Claims



31. The device of claim 33 wherein said core portion, said anti-rotational portion, and said post portion are symmetrical along said common axis, respectively.

Re. 32,825

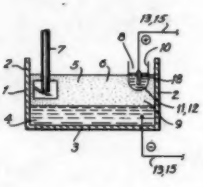
PROCESS FOR THE ELECTROCHEMICAL REDUCTIVE BLEACHING OF LIGNOCELLULOSIC PULP

Michael N. Hull, Bardonia, and Vacheslav M. Yasnovsky, Orangeburg, both of N.Y., assignors to International Paper Company, Tuxedo Park, N.Y.

Original No. 4,596,630, dated Jun. 24, 1986, Ser. No. 684,993, Dec. 21, 1984. Application for reissue Jun. 17, 1987, Ser. No. 63,466

Int. Cl.[4] D21C 9/10

U.S. Cl. 162—50 11 Claims



1. [A continuous] *An* electrochemical reductive process for increasing the brightness of lignocellulosic pulp which comprises reacting said lignocellulosic pulp with a polydentate ligand complex of Cr^{++} or V^{++} formed by the electrochemical reduction of the complexed trivalent chromium or vanadium metal ion having a concentration from about 0.1 millimole to the upper limit of solubility of the complex wherein the lignocellulosic pulp is brightened during the reaction.

Re. 32,826

CATIONIC TECHNETIUM COMPLEXES USEFUL AS RADIODIAGNOSTIC AGENTS

Karen E. Linder, Kingston, N.J., assignor to E. I Du Pont de Nemours and Company, Wilmington, Del.

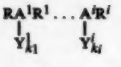
Original No. 4,512,967, dated Apr. 23, 1985, Ser. No. 404,372, Aug. 2, 1982. Application for reissue Feb. 6, 1987, Ser. No. 11,606

Int. Cl.[4] A61K 43/00, 49/00

U.S. Cl. 424—1.1 26 Claims

1. A cationic lipophilic complex of technetium wherein all of the coordination positions of the technetium atom are filled with a donor atom having a pair of electrons available for forming a coordinate bond with technetium to form said cationic complex, said donor atoms being provided by ligands or salts thereof, said ligands having the following structure:

(A)



wherein:

i is an integer from 1 to 6;

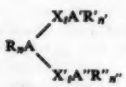
R, R^1, R^2, R^3, R^4, R^5 and R^6 are each independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups, and R plus R′ may be taken together to form a cyclic compound or separately to form a linear compound;

Y^1, Y^2, Y^3, Y^4, Y^5 are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

A^1, A^2, A^3, A^4, A^5 and A^6 are each, independently, a donor atom having a free electron pair available for complexing with Tc-99m or Tc-99 to form a cationic complex; and

k_1, k_2, k_3, k_4, k_5 and k_6 are each independently zero or one;

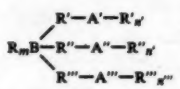
(B)



wherein:

R, R′ and R″ are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocylcloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

X and X′ are saturated or unsaturated alkyl groups; A, A and A″ are independently selected from the group of donor atoms having a pair of electrons available for complexing with Tc-99m or Tc-99 to form a cationic complex; t and t′ are independently 0 or 1; n is 0, 1 or 2; and n′ and n″ are independently the integer 1 or 2; or



wherein

R, R′, R″ and R‴ are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocylcloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

A′, A″ and A‴ are independently selected from the group of donor atoms having a pair of electrons available for complexing with Tc-99m or Tc-99 to form a cationic complex;

B is an atom selected from the group of donor atoms having

a pair of electrons available for complexing with Tc-99m or Tc-99, boron, or from the elements of Group IV A of the periodic table;

m is 0 or 1; and

n', n'' and n''' are independently the integer 1 or 2.

21. The cationic lipophilic complex of technetium of claim 1 wherein the Tc in said complex is Tc(I) and wherein said complex is $[^{99m}Tc(1,2\text{-bis-(dimethylphosphino)ethane})_3]^+$.

Re. 32,827

NEUTRAL HYDROCARBOXYCARBONYL THIONOCARBAMATE SULFIDE COLLECTORS

Yun-Lung Fu, Milford, and Samuel S. Wang, Cheshire, both of Conn., assignors to American Cyanamid, Stamford, Conn.

Original No. 4,657,688, dated Apr. 14, 1987, Ser. No. 806,585, Dec. 9, 1985. Division of Ser. No. 641,657, Aug. 17, 1984, Pat. No. 4,584,097. Application for reissue Jul. 30, 1987, Ser. No. 79,629

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—61 **13 Claims**

1. A collector composition for froth flotation of sulfide minerals comprising at least one hydrocarboxycarbonyl thionocarbamate selected from the group consisting of:

[N-ethoxycarbonyl-O-n-butyl thionocarbamate;]

N-ethoxycarbonyl-O-isobutyl thionocarbamate;

N-ethoxycarbonyl-O-sec. butyl thionocarbamate;

N-ethoxycarbonyl-O-n-amyl thionocarbamate;

N-ethoxycarbonyl-O-isoamyl thionocarbamate;

N-ethoxycarbonyl-O-phenyl thionocarbamate;

N-phenoxycarbonyl-O-ethyl thionocarbamate;

N-phenoxycarbonyl-O-isopropyl thionocarbamate;

N-phenoxycarbonyl-O-n-butyl thionocarbamate;

N-phenoxycarbonyl-O-isobutyl thionocarbamate;

N-phenoxycarbonyl-O-sec. butyl thionocarbamate;

N-phenoxycarbonyl-O-n-amyl thionocarbamate and

N-phenoxycarbonyl-O-isoamyl thionocarbamate.

Re. 32,828

PASSIVE INFRARED INTRUSION DETECTION SYSTEM

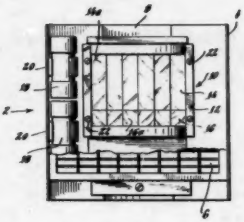
Philip H. Mudge, New Fairfield, Conn., assignor to Cerberus A.G., Switzerland

Original No. 4,275,303, dated Jun. 23, 1981, Ser. No. 93,443, Nov. 13, 1979. Application for reissue Jun. 9, 1983, Ser. No. 502,649

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—342 **24 Claims**

11. In a passive infrared intrusion detector of the type including an infrared sensing element, responsive to infrared radiation emanating from within at least one zone comprising an angular region of space desired to be protected and including means coupled to said sensing element for actuating a signal in response to changes in said infrared radiation within said zone, the improvement comprising: a lamp for emitting visible light and means for focusing said visible light to be emitted from said infrared intrusion detector into said angular region of space, said light being emitted in a direction generally parallel to the direction of radiation from said zone to said sensing element such that the boundaries of said



zone are defined by the location of said detector and the angular region of space in which said light is visually observable.

Re. 32,829

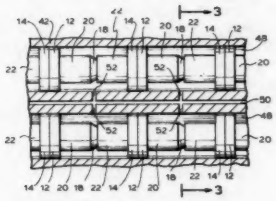
RECTIFIER WITH SLUG CONSTRUCTION AND MOLD FOR FABRICATING SAME

T. Michael McCann, Bensenville, Ill., assignor to General Instrument Corp., New York, N.Y.

Original No. 4,564,885, dated Jan. 14, 1986, Ser. No. 648,672, Sep. 10, 1984. Application for reissue Jul. 24, 1987, Ser. No. 77,636

Int. Cl.[4] H01G *9/16;* **H01L** *23/28, 3/00*

U.S. Cl. 361—436 **18 Claims**



1. A rectifier comprising a [substantially cylindrical] body situated between first and second end parts to form a unit, said end parts extending radially beyond the surface of said body and defining therebetween a recess adapted to receive a molding compound applied by injecting the compound into the recess when the unit is situated within a [substantially cylindrical] cavity in a mold, the cavity having [a diameter] *dimensions* substantially equal to the [diameters] *corresponding dimensions* of said end parts and being substantially longer than said unit, the end parts cooperating with the cavity walls to substantially seal said recess from the remainder of the cavity, the compound being injected into the recess through an opening in said cavity wall aligned with the recess.

PLANT PATENTS

GRANTED JANUARY 10, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,517

ROSE PLANT NAMED BENALAY

Frank A. Benardella, Old Tappan, N.J., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Mar. 26, 1987, Ser. No. 30,429
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by purple and near white bicolored flowers of good form which are long lasting on the plant and after cutting.

6,518

ROSE PLANT JACUTE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 19, 1987, Ser. No. 28,186
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant and parts thereof of the miniature class substantially as herein shown and described, characterized particularly as to novelty by an ability to root and grow rapidly in a four-inch pot, attractive hybrid tea form flowers of pink color, the occasional presence of seven sepals, over 100 petals per flower and resistance to powdery mildew.

6,519

APPLE TREE 'SANSA'

Yoshio Yoshida, Ibaraki; Tadayuki Hanada, Suzaka; Shichiro Tsuchiya, Morioka; Tetsuro Sanada, Ibaraki; Tetsuo Masuda; Hideo Bessho, both of Morioka, all of Japan, and Donald W. McKenzie, Havelock North, New Zealand, assignors to Fruit Tree Research Station, Ministry of Agriculture Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 12, 1987, Ser. No. 25,029
Claims priority, application Japan, Sep. 2, 1986, 61-2023
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as illustrated and described herein, characterized over known apple trees by (A) having a slightly weak vigor, but (B) having a good spur-bearing habit and a quite strong resistance to Alternaria blotch and Scab, (C) being reciprocal-fertile with main cultivars and productive with a regular crop and almost no physiological fruit drop, (D) having leaves with genetic yellow mottle inherited from a male parent 'Akane', and (E) producing a rather small fruit (a) maturing early in the season, and (b) having a two to three weeks keeping quality which is good as an early-maturing cultivar, a conical shape, a yellowish green ground-colored skin with a bright red coloring superior to 'Tsugaru', and a fine, juicy and crisp flesh which has a whitish yellow color, a good texture, a moderate sweetness and moderate acidity, and gives a good sweet-acid balance and an excellent dessert quality superior to 'Tsugaru'.

6,520

PRNUS SERRULATA (ROYAL BURGUNDY)

Franklin D. Parks, Rte. 2, Box 778, Beaverton, Oreg. 97007

Filed Dec. 8, 1986, Ser. No. 939,167
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—37 1 Claim

1. A new and distinct variety of *Prunus serrulata* as described and illustrated, distinguished from the species and other known varieties by the purplish red color of its leaves, the red branches, the purplish red stem and caps and the purplish Red blossoms.

6,521

LILY NAMED SUMMER PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Jan. 22, 1987, Ser. No. 6,024
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily, substantially as herein shown and described, characterized by its rich orange flowers accented by golden orange midribs and a decorative ring of spots encircling the center of the flowers; the excellence of the flower form; and its versatility both as a garden plant and as a pot plant variety well suited to forcing into flower out of season from properly precooled bulbs.

6,522

LILY NAMED IRISH PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Jan. 22, 1987, Ser. No. 6,025
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant, substantially as herein shown and described, particularly characterized by its rich orange flowers accented by lighter colored orange midribs and a decorative central ring of spots; the excellence of its flower form; and by its short stemmed, short leaved, upright flowering silhouette; and its versatility both as a garden plant and as a pot plant variety.

6,523

LILY NAMED COPELLIA

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Mar. 9, 1987, Ser. No. 23,780
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. The new and distinctive variety of Oriental hybrid lily plant and the parts thereof, substantially as herein shown and described, and particularly characterized by its unique upright to semi-upright flowers which have a clear pink coloration along the midrib of each tepal and between moderately broad, white tepal margins; and by its vigorous growth; the excellence of its flower form and substance; and its versatility both as a garden plant and as a cut flower producer from precooled bulbs forced under glass out-of-season.

6,524

AFRICAN VIOLET PLANT NAMED TRINIDAD

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 55,876
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet plant named Trinidad, as described and illustrated, and particularly characterized by its light lavender flowers with purple on the edge of the two smaller petals, white lightly frilled edges on the other petals; first flash of flowers forming a tight bouquet above the leaves; strong upright flower stems curving toward the center; profuse flowering; vigorous growth habit; medium green,

slightly hairy, oval leaves; and long lasting and non-dropping flowering habit.

6,525

AFRICAN VIOLET PLANT NAMED MOLOKAI

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 55,877

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Molokai, as described and illustrated, and particularly characterized by its light violet blue flowers which have a darker center and which fade out to a white edge; first flash of flowers forming a tight bouquet above the leaves on strong upright flower stems curving toward the center; profuse flowering; vigorous growth habit; dark green, serrated, velvety leaves, slightly hairy; and long lasting and non-dropping flowering habit.

6,526

AFRICAN VIOLET PLANT NAMED SHENANDOAH

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 55,928

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Shenandoah, as described and illustrated, and particularly characterized by its semi-double, dark blue flowers with wavy edges; nice bouquet formed on strong upright flower stems; vigorous growth habit; round to oval, medium green, slightly serrated leaves; and long lasting, non-dropping flowering habit.

6,527

AFRICAN VIOLET PLANT NAMED LEO

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haften, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,145

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Leo, as described and illustrated, and particularly characterized by its long-lasting, non-dropping, double, solid blue flowers with frilled edges; strong upright flower stems, curving toward the center; profuse flowering; vigorous growth habit; very attractive girl-type leaves, wavy, strongly serrated with a white to light green center; and long lasting and non-dropping flowering habit.

6,528

LILY PLANT NAMED 'CHERISHED'

Geradus C. Van der Salm, Rte. 1, Box 422, Woodland, Wash. 98674

Filed Mar. 13, 1987, Ser. No. 25,829

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described.

6,529

ZOYSIA GRASS PLANT CV 'P-1'

Walter L. Pursley, 1038 - 41st Ave. North, St. Petersburg, Fla. 33703

Filed Mar. 18, 1987, Ser. No. 27,620

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Zoysia grass plant, substantially as herein described and illustrated, characterized particularly by fast stolon and rhizome establishment, and of a softer finer texture, with excellent green color retention in the winter period; the new claimed Zoysia grass plant is almost entirely glabrous, of dark yellowish green color, color No. 137, with anthers of dark purplish red color, color No. 259.

6,530

CHRYSANTHEMUM PLANT NAMED CADET

Leonard H. Shoesmith, deceased, late of Woking, England (by May Victoria Shoesmith, executrix), and Peter S. Hesse, Bradenton, Fla., assignors to Ball Pan Am Plant Company, Parrish, Fla.

Filed May 29, 1987, Ser. No. 55,597

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—78 1 Claim

1. A new and distinct Chrysanthemum plant named Cadet, as illustrated and described, and particularly characterized by its bright yellow ray floret color, almost fully double flower form, jagged or uneven ray floret tips which give the cultivar a carnation-like appearance, cushion growth habit, 8 week flowering response, and by its adaptability to outdoor or commercial pot programs.

6,531

CHRYSANTHEMUM PLANT NAMED CRUSADER

Leonard H. Shoesmith, deceased, late of Westfield, England (by May V. Shoesmith, executrix), and Peter S. Hesse, Bradenton, Fla., assignors to Ball Pan Am Plant Company, Parrish, Fla.

Filed May 29, 1987, Ser. No. 55,603

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Crusader, as illustrated and described, and particularly characterized by its lavender ray floret color; single flower form; cushion growth habit; 8 week flowering response; and its ability to perform well in outdoor and pot mum programs.

6,532

AFRICAN VIOLET PLANT NAMED DENVER

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,412

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Denver, as described and illustrated, and particularly characterized by its profuse flowering, and very pure white flowers; strong upright flower stems curving toward the center; vigorous growth habit; bright green girl type velvet leaves with light green center; and long lasting and non-dropping flowering habit.

PATENTS

GRANTED JAN. 10, 1989

ERRATA

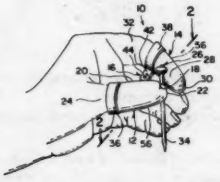
For CLASS	See PATENT NO.
057-006	4,796,414
059-093	4,796,420
116-173	4,796,553
119-028	4,796,563
600-022	4,796,605
600-018	4,796,606
383-109	4,797,010
405-291	4,797,023
055-227	4,797,132
162-135	4,797,176
549-038	4,797,298
430-065	4,797,299
514-018	4,797,471
219-010	4,797,521
370-063	4,797,589
341-051	4,797,653
341-050	4,797,654
365-154	4,797,804
380-049	4,797,928

PATENTS

GRANTED JANUARY 10, 1989

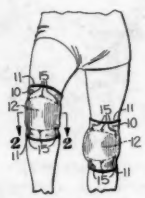
GENERAL AND MECHANICAL

4,796,302
FINGER AND THUMB PROTECTOR
Charles L. Davis, c/o George Spector, 233 Broadway RM 3815, and George Spector, 233 Broadway RM 3815, both of New York, N.Y. 10007
Filed Nov. 2, 1987, Ser. No. 115,836
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—21 **4 Claims**



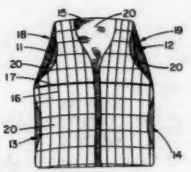
1. A finger protector which comprises:
(a) a pair of longitudinal sheaths, said first sheath having a depression on inner side near tip end thereof, said first sheath being of a size to fit over thumb of a person and said second sheath having a depression on inner side near tip end thereof, whereby said depressions are adapted to hold and guide a nail for being driven by a hammer when said depressions are in close proximity, said second sheath being of a size to fit over the index finger of the person;
(b) means pivotaly connecting said sheaths between said depressions and the joint connecting the finger and thumb whereby said sheaths are movable from an open position to a closed position with said depressions are in close proximity for holding and guiding said nail; and
(c) said sheaths having cavities at said tip ends.

4,796,303
KNEE PROTECTOR PAD
W. David Atwater, Yanceyville, N.C., assignor to Royal Textile Mills, Inc., Yanceyville, N.C.
Filed Nov. 23, 1987, Ser. No. 124,020
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—24 **6 Claims**



1. A protector pad for cushioning and protecting the knee of a volleyball player and the like, said protector pad including:
an elastic sleeve of textile fabric having sufficient length to cover the knee and adjacent portions of the calf and thigh of the wearer and having sufficient elasticity to snugly fit the area of the knee of the wearer,
a substantially flat elastomeric foam pad having an elliptical configuration with a major axis extending transversely of the knee of the wearer and being of sufficient width to cover opposite sides of the knee, and a minor axis extending longitudinally of the knee and being substantially shorter than said major axis,
a knit sleeve completely enclosing said elastomeric foam pad and being closed by lines of stitching at opposite upper and lower edges thereof, said pad and said knit sleeve being positioned inside of said elastic sleeve, and
spaced bar tack stitching attaching each of said upper and lower edges of said knit sleeve to said elastic sleeve to maintain said pad in a particular position inside of said elastic sleeve and across and along opposite sides of the knee of the wearer so that said elastic sleeve holds said pad in an arcuately curved configuration with said pad overlying the front and sides of the knee during use, and wherein said spaced bar tack stitching maintains full stretchability of said elastic sleeve when doffing and donning said protector pad.

4,796,304
VENTILATED HUNTING CLOTHING
Earl Shelby, 209 N. Linn St., Glenwood, Iowa 51534
Filed Oct. 19, 1987, Ser. No. 110,673
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—94 **3 Claims**



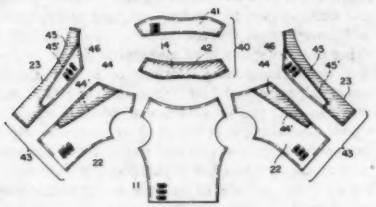
1. A hunting vest or the like comprising;
(a) a base fabric material,
(b) a net-like mesh material;
(c) said net-like mesh material covering the outside surfaces of said hunting vest and being attached to said base fabric material along the edges thereof except at selected edge portions and at other loci thereby forming openings thereat and pocket like structures in said vest or the like between said base fabric material and said net-like mesh material.

4,796,305
GARMENT
Mitsuru Itoh, 23-12, Chu-ou 1-chome, Edogawa-ku, Tokyo, Japan
Filed Oct. 21, 1987, Ser. No. 110,877
Claims priority, application Japan, Nov. 13, 1986, 61-268700
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—97 **5 Claims**

1. A garment comprising:
a body piece including a lapel portion;
a flyback joined to said lapel portion at one edge, said joined flyback and lapel portion being folded back against said body piece to form a lapel extending between the thus formed fold and said one edge;
a first expansible and contractible interfacing piece covering at least a portion of the surface of said lapel portion facing the flyback;
a second expansible and contractible interfacing piece covering at least a portion of the surface of said flyback facing said lapel portion, the opposite side of said flyback being

free of interfacing material and forming the exterior surface of the folded lapel;

a first stitch, generally parallel to said one edge, joining said first interfacing piece to said body piece, said first interfacing piece extending between said one edge and said first stitch and beyond said first stitch to form a first free end portion;



a second stitch, generally parallel to said one edge, joining said second interfacing piece to said flyback, said second interfacing piece extending from the edge of said flyback opposite said one edge to said second stitch and beyond said second stitch to form a second free end, said second free end being folded back upon itself and joined to said first free end, said folded second free end urging said lapel outwardly to retain its shape.

4,796,306

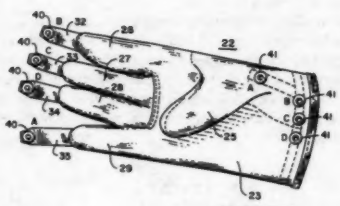
READILY ADJUSTABLE GRIP ENHANCING GRIPPING GLOVE

Rodger Mitchell, 921 Pontiac, Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 22,989, Mar. 6, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 173,044

Int. Cl.[4] A41D *19/00*

U.S. Cl. 2—160 6 Claims



1. A gripping glove comprising:

a palm;

first through fourth fingers;

a thumb; and

a back portion for receiving the hand of a user; and

first through fourth resilient grip-enhancing fource-applying means, each of said means including an elastic strap, means on the back of the associated finger for positioning said strap along the back of the finger, means securing a front end of each said strap to a predetermined position on said palm, and means for adjustably positioning a back end of each of said straps to said back portion such that the grip-enhancing force applied by the associated straps running behind the associated fingers of the user's hand within the glove for optimally distributing said grip enhancing force.

4,796,307

EAR PROTECTOR

Kurt Vantine, 105 E. Fairmount Ave., Maywood, N.J. 07607

Filed Mar. 12, 1987, Ser. No. 24,989

Int. Cl.[4] A42B *1/06*

U.S. Cl. 2—209 1 Claim

1. An ear protector for use with a headband or similar appliance, which protector comprises:

(a) a cap member of sufficient size and shape for covering an ear;

(b) suspension means including first and second ends;

(c) means pivotally connecting the cap member to the first end of the suspension means for permitting the adjustable positioning of the cap member with respect to the disposition of the ear;

(d) means for attaching the second end of the suspension means to a headband; and

(e) means for securing the protector to the temple of an eyeglass frame, which securing means includes arms attached to the cap member, each arm having a free end, and means carried at each free end for detachably securing same to the temple.

4,796,308

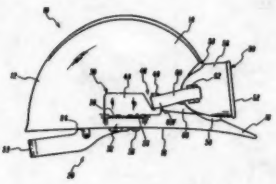
METHOD FOR RETAINING GOGGLES ON HELMET

Roy M. Bourgeois, Baton Rouge, La., assignor to American Allsafe Company, Irving, Tex.

Division of Ser. No. 052,616, May 20, 1987, Pat. No. 4,764,989. This application Feb. 1, 1988, Ser. No. 150,733

Int. Cl.[4] A42B *1/24;* A61F *9/02*

U.S. Cl. 2—243 R 2 Claims

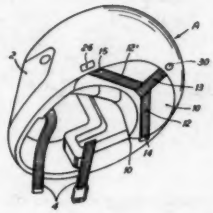


1. A method for retaining safety goggles against the crown of a safety helmet wherein said safety goggles are provided with an elastic head strap the ends of which are fastened to opposite sides of the goggles, comprising the steps of attaching first and second hook retainers onto the helmet on opposite sides of a crown portion of the safety helmet; placing the goggles and the head strap against said crown portion of the safety helmet; folding the head strap to produce first and second strap folds adjoining opposite sides of the goggles, respectively; and, looping the folded portions of the head strap around the retainer hooks with a major portion of the head strap engaging said crown portion of the safety helmet engaged by said goggles.

4,796,309
PROTECTIVE HELMET RETAINED ON THE REAR OF WEARER'S HEAD

Pier L. Nava, Bergamo, Italy, assignor to Nava & Co. S.p.A., Verderio Superiore, Italy

Continuation of Ser. No. 858,374, May 1, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 105,504
Claims priority, application Italy, Jul. 17, 1985, 21607 A/85
Int. Cl.[4] A42B 3/02
U.S. Cl. 2—414 3 Claims

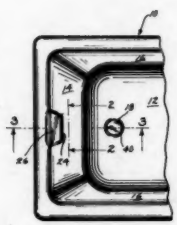


1. Protective helmet with an arched ribbon type element which engages and cooperates with the wearer's nape, for sports and similar uses, comprising flexible inextensible band-like means anchored in the rear internal part of the helmet to engage the lower part of wearer's neck, the flexible, band-like means comprising a Y-shaped structure the improvement comprising housing the Y shaped structure in the internal portion of the helmet the end of the stem of the Y being anchored in the rear central lower part of the helmet while the two lateral arms are housed laterally in the internal lower edge of the helmet and said Y shaped structure being embedded in a soft material.

4,796,310
BATHTUB DRAIN VALVE CONTROL AND OVERFLOW PLATE

Robert Freville, Sheboygan Falls, and Philip Segor, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.

Continuation of Ser. No. 885,055, Jul. 14, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,923
Int. Cl.[4] E03C 1/24
U.S. Cl. 4—199 4 Claims

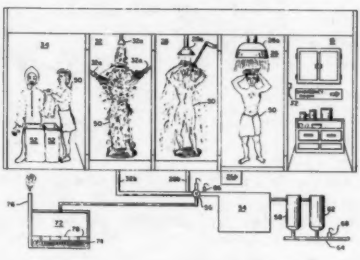


1. A bathtub drain valve control arrangement, comprising:
- a substantially vertical bathtub wall defining an overflow opening which is adapted to communicate with a downwardly directed drainpipe;
- a bathtub floor defining a drain opening which is adapted to communicate with said drainpipe:
- a drain valve for opening and closing fluid communication through said drain opening;
- an overflow cover movably mounted adjacent one end on said substantially vertical bathtub wall so as to substantially conceal said overflow opening, said overflow cover adapted to move between open and closed positions and having a generally smooth outer surface, such that, in said closed position, said overflow cover is substantially flush with said vertical bathtub wall to follow the contours of the wall to provide a surface against which a bather could comfortably lean; and
- a linkage connection said overflow cover and said drain valve, said linkage including a first linkage member pivotally connected to said overflow cover at a pivot point spaced from said mounting of said overflow cover and a second linkage member pivotally connected intermediate its ends to said bathtub wall, said second linkage member also being pivotably connected adjacent one end to said first linkage member, and linkage means connected between the other end of said second linkage member and said drain valve such that by moving said overflow cover to the open position causes one end of said second linkage member to rise and the other end to be lowered and said linkage means opens said drain valve, and moving said overflow cover to the closed position causes one end of said second linkage member to be lowered and the other end to be raised and said linkage means closes said drain valve.

4,796,311
CHEMICAL AND/OR RADIATION DECONTAMINATION

Jay Shankman, 48 Castle La., Holtsville, N.Y. 11742

Filed Apr. 10, 1987, Ser. No. 37,208
Int. Cl.[4] A47K 3/22; A61N 5/00
U.S. Cl. 4—596 2 Claims



1. An intake facility added on to and in combination with the emergency room of a hospital, said facility having an entrance separate from and in addition to the entrance to said emergency room for receiving and processing the disaster victims of chemical contamination prior to delivery of said victims as patients to said emergency room for treatment, comprising, external dock means for accepting exclusively as patients said victims, a contaminated intake area within said facility isolated from said emergency room for receiving said patients, trauma room means communicating with said contaminated intake area for receiving and permitting treatment of trauma patients, means in parallel with said trauma room means for receiving patients free of trauma comprising first room means for bagging the garments of the latter said patients, ejector room means for spraying patients emerging from said bagging room means with water under pressure of at least 75 psi mixed with detergent to remove adherent surface contamination, wash down room means for receiving patients emerging from said ejector room means for deluging said patients with a large flow of water to remove water and detergent remaining from said ejector room means, drying room means for blow drying patients emerging from said wash down room means, and triage room means for examining patients emerging from said drying room means, the openings into and out of said bagging, ejector, wash down and drying rooms means being aligned so that all of the patients in said room means can be viewed from

said triage room means, means for connecting said triage and said trauma room means directly to said emergency room, thereby isolating said emergency room from said chemical decontamination, means for treating the waste water from said ejector and wash down room means to permit its reintroduction into the environment, said treating means including holding tank means for receiving said waste water, and filter means for removing contaminents in said water prior to return to the environment.

4,796,312

BATHTUB WITH ACCESS DOOR IN THE SIDE THEREOF

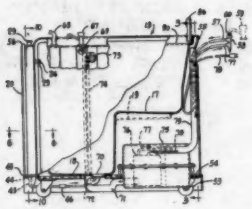
Fred J. Corlew, 615 W. 48th St., Box 507, Ashtabula, Ohio 44004

PCT No. PCT/US84/01092, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00510, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 13, 1984, Ser. No. 845,265

Int. Cl.[4] A47K *3/02*

U.S. Cl. 4—555 **17 Claims**



1. A bathtub comprising: a body portion, said body portion including:

a horizontal base

opposing, parallel vertical first and second walls on opposite sides of said base;

a vertical third wall interconnecting said first and second walls and said base; and

an entrance to said bathtub opposite said third wall, said entrance including opposing, vertical side edges and a horizontal base edge extending between said side edges;

a door for closing said entrance, one of said door and said entrance having an attachment surface and the other of said door and said entrance having an engagement surface wherein said door includes a central recessed portion, said attachment surface is disposed on said side edges and said base edge of said entrance, and said engagement surface is on said door projecting outwardly from said central recessed portion, said engagement surface being chamfered toward said central recessed portion;

hinge means for mounting said door on said body portion for pivotal movement between open and closed positions about an axis along one of the edges of said entrance; and

a single sealing means for sealing the interface of said door and said edges against the flow of water when the door is in the closed position, said sealing means including an elastic, elongated generally flat sealing member having an attachment edge portion and free edge portion, said attachment edge portion being attached to said attachment surface;

said free edge portion engaging said engagement surface to form the sole seal at the interface of said door and said edges against the flow of water when said door is in the closed position and the bathtub is filled with sufficient water to exert water pressure on said sealing member.

4,796,313

INVALID TRANSFER ARRANGEMENT

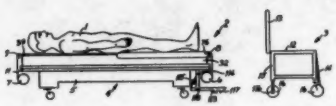
Paul DiMatteo, Dix Hills; Charles F. Chubb, Brookville, and Stewart Senator, Patchogue, all of N.Y., assignors to Nova Technologies Inc., Hauppauge, N.Y.

Division of Ser. No. 825,204, Feb. 3, 1986, Pat. No. 4,726,082, which is a continuation-in-part of Ser. No. 731,533, May 7, 1985, Pat. No. 4,776,047. This application Oct. 9, 1987, Ser. No. 107,372

The portion of the term of this patent subsequent to Mar. 23, 2005, has been disclaimed.

Int. Cl.[4] A61G *7/08*

U.S. Cl. 5—81 R **4 Claims**



1. An invalid transfer arrangement comprising: a bed having a mattress, a bed frame, and legs; transport means having rollers at opposite ends of the bed; a flexible sheet on which a person may lie and extending over said mattress between said rollers; roller drive means for winding said sheet from a roller at one bed end and unwinding said sheet from a roller on the opposite bed end for pulling said sheet across the mattress surface so as to cause the person in a supine position to be transported across the bed; lift means having lift arms extending along each side of said mattress and movably attached to pivot points near the foot-end of said bed; lift drive means for causing said lift arms to rise above said mattress surface and rotating about said pivot points; lifting support means attached to said lift arms for raising the person to a sitting or standing position at the end of the bed.

4,796,314

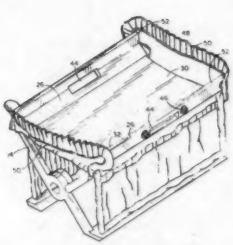
PORTABLE INFANT FURNITURE

Stephanie Garduno, 33811 Oldbridge Rd., Dana Point, Calif. 92629

Filed Dec. 22, 1986, Ser. No. 945,376

Int. Cl.[4] A47D *7/00*

U.S. Cl. 5—98 A **11 Claims**



1. An infant bed foldable between unfolded and folded configuration, comprising:

a. a folding frame formed of:

(1) first and second end cross members at each end thereof which are centrally pivotally engaged;

(2) first and second upper rail members extending longitudinally between the upper ends of said cross members;

(3) first and second lowermost foot members, fixedly secured to and extending longitudinally between the lower ends of said cross members and at 45 degrees thereto, to spread outwardly when said bed is in its folded position and to assume a horizontal position when said bed is in its

unfolded position, thereby stabilizing said bed in both folded and unfolded positions;

(4) first and second upper longitudinal lips, each having a centrally located elongated hand hold slot, coextensive with a respective one of said first and second upper rail members and dependent therefrom at 45 degrees thereto to assume a vertical position when said bed is in its unfolded position and to close inwardly and meet along respective inside upper edges and form a carrying handle when said bed is in its folded position; and

b. a fabric mat extending between the supported by said longitudinal rail members.

4,796,315

ROTATIONALLY CONTOURED LUMBAR CUSHION

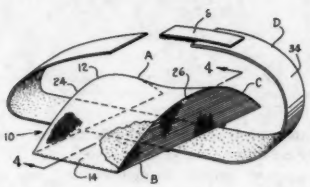
Randolph E. Crew, 110 Stonehedge Dr., Greenville, S.C. 29615

Filed Jan. 27, 1986, Ser. No. 822,321

The portion of the term of this patent subsequent to Mar. 10, 2005, has been disclaimed.

Int. Cl.[4] A61F *5/01*; A47C *20/02*

U.S. Cl. 5—431 **8 Claims**



1. A rotationally contoured lumbar cushion for cradling the lumbar area while strapped to the back and facilitating turning while lying in a variety of bedrest positions comprising:

a cushion block of resilient polyurethane foam material having a lower base and an upper lumbar cradle;

said upper lumbar cradle including a convex surface for engaging a length of the spine along said lumbar area;

a concave cradle surface formed in said lumbar cradle spanning the lumbar area laterally from adjacent one side of the back to the other;

a winged cradle extension defined by said concave cradle surface extending past said lower base on opposing sides of said lower base for gripping the sides of said back, spanning said lumbar area laterally;

a rotationally contoured sidewall tapering outwardly from each said opposing side of said lower base to said winged cradle extension at each side of said cushion block, the sidewalls defining defining angles between said sidewalls and the lower base of between 45° and 75°;

said rotationally contoured sidewalls defining a fulcrum at the intersection of said lower base facilitating turning of said cushion block cradling said lumbar area between side rotated fetal and supine positions; said outwardly tapered sidewall and said lower base about which said cushion block rotates;

strap means encircling said cushion block and a waist of said person for strapping said cushion block in a lumbar cradling position during turning; and

said strap means securing said lateral winged cradle surfaces against side portions of the lower back of said person to facilitate rotation of said person without altering the cradling position of said cushion block while supporting the spine in said lumbar area.

4,796,316

MATTRESS WITH AERATION CAVITIES

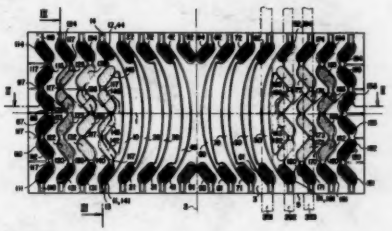
Alain Boselli, Triel Sur Seine, France, assignor to Dunlop France, Hauts-de-Seine, France

Filed Nov. 12, 1987, Ser. No. 119,507

Claims priority, application France, Nov. 13, 1987, 86 15732

Int. Cl.[4] A47C *27/00*

U.S. Cl. 5—464 **9 Claims**



1. A mattress comprising a layer of a flexible material with a lower face (3) by which the mattress may bear on an undermattress, and an upper face (4) intended to receive the body of a person, each face being defined by an edge (5, 6), the lower face (3) having a plurality of pockets (111 to 116) disposed at the periphery of the mattress and extending into a major part of the thickness of the mattress, wherein said mattress is an expandable plastic foam, the lower face (3) having several grooves (110, 120) extending into a small part of the thickness of the mattress, said pockets being disposed in line with said grooves so as to locally increase the depth of the grooves.

4,796,317

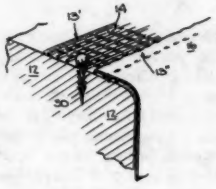
DUST RUFFLES FOR A BED

Robert Kallman, 2030 Haring St., Brooklyn, N.Y. 11229, and Mark Henderson, 8 School Ave., Chantham, N.J. 07928

Filed Oct. 28, 1987, Ser. No. 114,628

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—493 **7 Claims**



1. A valance for a bed, comprising:

a ruffled portion; and,

an unruffled portion attached to said ruffled portion, said unruffled portion comprising a flexible mesh material in combination with fastener means adapted to penetrate the apertures of said flexible mesh material to thereby fasten said valance to portions of said bed.

4,796,318

FISHERMAN'S PLIERS

Albert L. Bigej, 24775 Trask River Rd., Tillamook, Oreg. 97141

Filed Nov. 12, 1987, Ser. No. 119,692

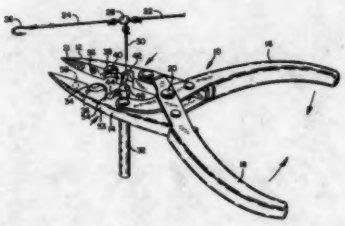
Int. Cl.[4] A01K *69/00*; B25F *1/00*

U.S. Cl. 7—106 **10 Claims**

1. In combination with a pair of fisherman's pliers wherein a pair of elongated and tapered jaws are pivotally connected to a pair of handles such that the jaws are brought together as the

handles are brought together, wherein the improvement comprises:

cutting means on the jaws for cutting an elongated piece of lead wherein the cutting means comprises blade means in one of the jaws extending toward the other jaw for cutting the lead as the jaws are brought together and lead retaining means in the other jaw for holding the lead as it is cut;



notching means on the jaws for impressing a notch into the elongated piece of lead;

first crimping means on the jaws for pressing the notch closed; and

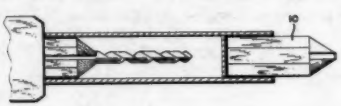
second crimping means on the jaws for receiving and crimping a spherical piece of lead.

4,796,319

COMBINATION SCREW-TAPPING AND SCREWDRIVING TOOL

David Taft, 2 Capron St., Uxbridge, Mass. 01569

Filed Jun. 11, 1987, Ser. No. 60,654
Int. Cl.[4] B25F *3/00*
U.S. Cl. 7—158 2 Claims



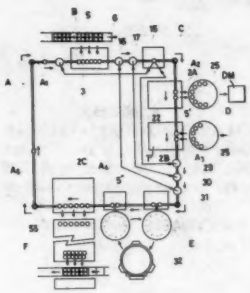
1. A drill bitholder, said holder being a hexagonal rod with a cylindrical aperture running longitudinally down the center, a slot running longitudinally the length of the holder and extending radially from the center aperture to the outside hexagonal surface, said holder having at one end a conical tip with an abrasive cutting means, said central cylindrical aperture corresponding in diameter to specific drill bit sizes recommended for the drilling of pilot holes for specific screw sizes, whereby the corresponding drill bit is inserted through the aperture of the bitholder to a desired depth relative to the conical end of the bitholder, the conical end being the frontal end with the bit extending from it outward to the bit tip, said depth determined by the desired pilot hole depth, whereupon the drill bitholder is engaged distal end first in the chuck of a drill for up to two-thrids its length, and upon tightening of the chuck, the inward pressure of the chuck forces the bitholder to contract radially against the drill bit, holding it firmly in place, said assembly ready for drilling a pilot hole to a preferred shape, said shape corresponding in whole or in part to the embodiments of the bit and bitholder assembly, said embodiments being the cylindrical shaft of the bit, the conical flared end of the bitholder, and the enlarged cylindrical shape produced by the hexagonal bitholder in rotation, said pilot hole shape determined by the depth with which the tool is forced into the workpiece to produce the desired hole for simple flush-mounting, countersinking, or counterboring of various screw types.

4,796,320

METHOD OF DYEING AND HYDRO-EXTRACTING COLLECTIVELY YARN CHEESES AND APPARATUS THEREFOR

Nobutaka Ono, Ashiya, Japan, assignor to Osaka Bobbin Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1987, Ser. No. 129,859
Claims priority, application Japan, Jul. 11, 1987, 62-173479
Int. Cl.[4] D06B *3/04*
U.S. Cl. 8—155.2 4 Claims



1. A method of dyeing and hydro-extracting yarn cheeses collectively comprising the sequential steps of:

mounting empty spindles on mobile trucks and conveying said trucks carrying the spindles thereon following a rail;

inserting extension spindles on said empty spindles;

inserting simultaneously a plurality of yarn cheeses each wound about a bobbin and supplied form a carton on said spindles surmounted with the extension spindles until a definite number has been reached;

attaching spacers;

pressing the cheeses in the spindle direction with the actuation of a press machine;

removing said extension spindles and locking with fasteners, thereby providing cheese-mounted spindles;

mounting said cheese-mounted spindles on the mobile trucks and conveying them following the rail up to a location of a turntable;

loading said cheese-mounted spindles on a carrier on said turntable until a required number has been reached;

charging said carrier thus loaded into a dyeing machine for effecting a cheese dyeing;

subsequently discharging dyed cheese-mounted spindles from said dyeing machine together with said carrier to restore them on the turntable;

mounting and transferring said dyed cheese-mounted spindles on the mobile trucks on the rail;

removing said fasteners and spacers, and then dyed cheeses from the spindles to house a given number of said dyed cheeses in a hydro-extracting basket;

charging said basket thus filled into a hydro-exterior for purposes of undergoing a hydro-extracting treatment;

transferring and aligning hydro-extracted cheeses on a conveyor;

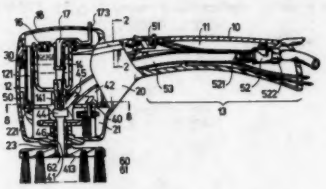
placing said cheeses aligned in a dryer to effect drying for a required time; and

delivering and storing dried cheeses in cartons, whereby the sequential steps are performed systematically in their sequence.

4,796,321
PORTABLE ELECTRICAL BRUSH

Fu-Kuei Lee, P.O. Box 10780, Taipei, Taiwan

Filed Aug. 12, 1985, Ser. No. 764,628
Int. Cl.[4] A46B *13/04*
U.S. Cl. 15—29 6 Claims

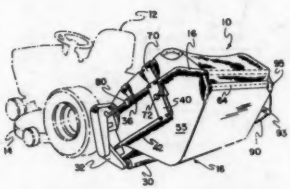


1. A portable electrically driven brush comprising:
a casing having upper and lower portions forming a hollow interior compartment;
a support plate mounted in said compartment;
motor means and speed reduction gear means mounted on said support plate, said motor means including switch means to control said motor means;
means coupling said motor means to said reduction gear means;
a hollow shaft mounted in said lower portion and having an upper end a lower end, said upper end coupled to said reduction gear means and said lower end extending outside of said lower portion;
a pipe means extending from within said casing into said hollow shaft;
a water supply means coupled to said casing and connected to said pipe means to discharge water through said hollow shaft, said water supply means having valve means to control the flow therethrough;
an additive container mounted on the upper casing portion, said container having means to discharge additive from said container to said pipe means to mix said additive with said water prior to discharge from said hollow shaft, said means to discharge including outlet means from the container and valve means to control said outlet means; and
a brush mounted on the lower end of said hollow shaft, said brush having a central opening mounting said brush on said hollow shaft and providing means for passage of water and additive through said brush to a work surface.

4,796,322
REAR DUMPING LAWN SWEEPER WITH FOLDING WIND APRON

Jeffrey A. Steed, Union City, Ind.; Walter F. Ruhl, and James M. Weaver, both of Greenville, Ohio, assignors to Lambert Corporation, Ansonia, Ohio

Filed Apr. 4, 1988, Ser. No. 176,906
Int. Cl.[4] E01H *1/04*
U.S. Cl. 15—79 A 3 Claims

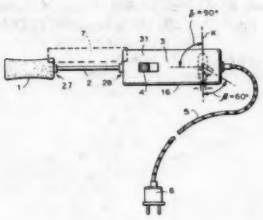


1. In a powered lawn sweeper having a rear-dumping hamper in which lawn debris such as grass clippings are collected, and in which an open top hamper is mounted on a hamper support frame for movement between a normal position for collecting such lawn debris therein from the sweeper, and a rear-dumping position in which the hamper is rotated on the frame such that a back wall of the hamper is lowered with respect to the floor of the hamper while the floor thereof is elevated, the improvement comprising:
a wind apron proportioned normally to cover the open top of the hamper,
said wind apron being formed of a foldable open mesh material,
said wind apron having a forward end,
means attaching said wind apron forward end to a forward portion of said hamper,
means supporting said wind apron in relatively closing relation to said hamper open top in the normal position of the hamper,
said hamper support frame having a transverse wind apron support member,
said support member being positioned closely adjacent the hamper back wall in said normal position thereof,
means attaching a rear portion of said wind apron to said transverse support member such that said hamper top is closed by said wind apron in said normal position, and
said back wall being movable away from said support member during rotation of said hamper to said dumping position to expose the contents of said hamper for rear dumping, accompanied by folding of said wind apron about said support member.

4,796,323
ELECTRIC TOOTHBRUSH

Dieter Benz, Hirschstrasse 21, 7900 Ulm, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,235, Mar. 26, 1985, abandoned, which is a continuation of Ser. No. 379,575, May 17, 1982, abandoned. This application Dec. 31, 1986, Ser. No. 948,051
Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120300; Mar. 31, 1982, 3211984
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—23 3 Claims



1. In a motor driven electric toothbrush comprising an elongated housing serving as a grip and accomodating an electric motor having a drive shaft; a rotary brush connected to an end of said drive shaft; at least one gravity-induced movement-responsive first switch positioned in said housing and having a switching path formed between two end points serving as contacts of said first switch, and a second switch, each switch being formed for switching a direction of rotation of said brush, the improvement comprising said second switch being a manually actuated hand switch having an actuating element, said housing having a side wall, said second switch being positioned on said side wall, said switching path being curved, a plane in which said end points of said switching path is located forming with an axis of elongation of said housing an angle between 60° and 90°, said housing including a guide forming said switching path, and a contact element movable in said guide and adapted to contact a respective one of said contacts depending on the position of said housing, said guide being formed so that said housing may be turned at an angle

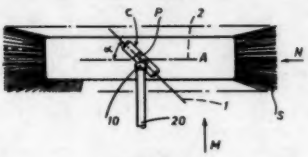
between 5° to 15° to change the direction of rotation of said brush.

4,796,324

BROOM OR BRUSH WITH HINGED HANDLE

Francesco Sartori, Via San Felice, 44, 40122 Bologna, Italy

Filed Sep. 25, 1987, Ser. No. 101,371
Int. Cl.[4] B25G *3/38*
U.S. Cl. 15—144 R 5 Claims



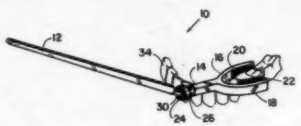
1. Broom or brush with hinged handle, comprising: a back, into which bristles are set in a plurality of tufts; said back having a longitudinal axis, a hinge, said hinge having a longitudinal axis of rotation disposed at a first acute angle to the longitudinal axis of the back; a pivot, associated with and extending from the hinge and affording means for the attachment of a handle, said pivot having an axis disposed at a second acute angle to the axis of the hinge.

4,796,325

ANGULARLY ADJUSTABLE DOUBLE HEADED TOOTHBRUSH

Issar Bortman, 20441 NE. 30 Ave. #324, N. Miami, Fla. 33180

Filed Oct. 29, 1987, Ser. No. 114,045
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167.2 2 Claims



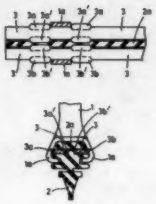
1. A double headed pivotal toothbrush, comprising:
a handle portion;
a bifurcated head portion having spaced facing brushes;
a pivotal connection between said handle portion and said head portion including a ball attached to said handle portion by an elongated reduced diameter neck and a longitudinally slotted socket collet attached to said head portion;
said head portion and said socket integrally molded from a plastic material;
a slip ring disposed around an outer surface of said socket collet for expanding and contracting said collet;
a curved radially projecting circular lip formed at an outer end of said socket collet;
an outer surface of said collet from said head portion to said radially projecting lip being generally cylindrical;
and
a concave spherical seat formed within said sicket collet.

4,796,326

DEVICE FOR CONNECTING A WIPING ELEMENT TO THE SUPERSTRUCTURE OF A WIPER BLADE

Christian Beneteau, Gorcy, France, and Norbert Guerard, Virton, Belgium, assignors to Champion Spark Plug Europe S.A., Binche, Belgium

Filed Aug. 17, 1987, Ser. No. 86,364
Claims priority, application France, Aug. 19, 1986, 86 11834
Int. Cl.[4] B60S *1/02*
U.S. Cl. 15—250.42 14 Claims



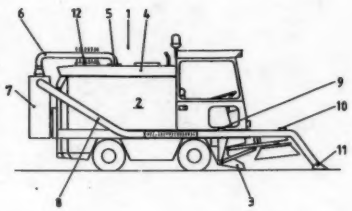
1. A device for securing a wiping element (2) to the superstructure (1, 11) of a wiper blade wherein the wiping element (2) is reinforced by two backing strips (3, 13) respectively located in two longitudinally extending recesses provided in the wiping element (2) and wherein the superstructure (1, 11) is provided with at least two claws (1*a*, 11*a*) which particularly surround the two backing strips (3,13) and the upper portion of the wiping element (2), characterized in that in the area of at least one of the claws (1*a*, 11*a*) of the superstructure (1,11) of the wiper blade at least one of the two backing strips (3,13) is provided, at its exterior longitudinal edge, with one flattened area (13*a*, 13*b*) which laterally projects from said exterior longitudinal edge and means are provided on one of the claws (11*a*) for cooperating with the one flattened area (3*a*, 3*b*; 13*a*, 13*b*) to limit relative longitudinal movement in opposite directions between the one claw (11*a*) and the at least one of the backing strips (3, 13) said cooperating means on the one of the claws and one flattened area being in alignment transverse to the length of the at least one backing strip—

4,796,327

APPARATUS FOR PICKING UP DOG EXCREMENT

Hans H. Doyen, Neustadt-Gimmeldingen, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,208
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632787
Int. Cl.[4] E01H *1/08*
U.S. Cl. 15—340.3 4 Claims



1. An apparatus for picking up dog excrement in combination with a self-propelled street sweeper, comprising a dirt container and a pick-up device cooperating with sweep brushes and being positioned below said dirt container and

connected directly to said dirt container to convey picked up dirt thereinto, said dirt container including a cover and a connecting piece mounted on said cover, a separating container attached to said dirt container; a suction line connecting said separating container to said connecting piece; and a suction hose having one end opening into said separating container and another end terminating with a nose piece to pick up the dog excrement which is conveyed into said separating container through said suction hose and is separated therein from a suction stream so that the suction stream freed from the dog excrement passes through said suction line into said dirt container.

4,796,328
ERASER

Fumio Horie, Tokyo, Japan, assignor to Horie Sangyo Kabushiki Kaisha, Tokyo, Japan

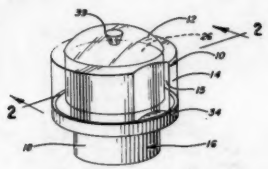
Filed Dec. 16, 1987, Ser. No. 133,565
Claims priority, application Japan, Dec. 18, 1986, 61-302631
Int. Cl.[4] B43L *19/00*
U.S. Cl. 15—424 **4 Claims**

1. An eraser having an integral structure composed of plural types of eraser pieces having different hardnesses and an abrasive material, said eraser pieces and said abrasive material existing respectively in a particulately dispersed state.

4,796,329
FAUCET HANDLE

Steven Bory, River Forest, Ill., assignor to Injecto Mold, Chicago, Ill.

Filed Mar. 24, 1987, Ser. No. 29,624
Int. Cl.[4] B25G *1/10*
U.S. Cl. 16—121 **20 Claims**

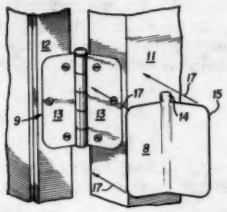


1. A faucet handle which comprises:
a light-transmissive upper portion having a top and a downwardly depending skirt;
a lower portion connected to the upper portion, the lower portion having a top with an outer peripheral wall that extends downwardly from the top and has an outer diameter that is less than the inner diameter of said skirt;
said lower portion top having a central sleeve extending downwardly therefrom for connection to faucet handle hardware;
said central sleeve having its lowest extremity lying in a plane that is above the plane of the lowest extremity of said lower portion;
means interposed between the light-transmissive upper portion and the lower portion to prevent viewing of the lower portion through the light-transmissive upper portion whereby viewing of the faucet handle hardware connected to said central sleeve is prevented.

4,796,330
HINGE MASK

Frederick J. Ziegler, 205 Slitting Mill Pl., Baltimore, Md. 21228

Filed Mar. 2, 1988, Ser. No. 163,320
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—251 **1 Claim**

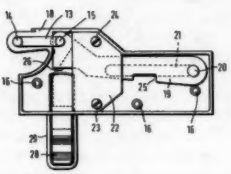


1. In an arrangement for protecting a hinge from having a material coated thereon during coating of a door and door frame, comprising, a door in said door frame wherein said hinges each comprise a pair of hinge leaves and a hinge pin, said hinges having a front face and an opposite back face, a hinge mask product comprising, a base of planar material and a hinge mask, said hinge mask consisting of two monolithic parts spacially positioned on said base, with the inner faces of said two parts being adhesive faces for being removably and adhesively attached to said base, one of said two parts being smaller in size than the other part, said one part being in the shape of a rectangle, said other part having a tab unitarily formed thereon and located on one side substantially midway between two ends, wherein said two parts are enclosed by kiss-cut lines for removing said parts from said base for attachment to the hinge, and said hinge mask adhesively positioned on the front and back faces of said hinges wherein said adhesive face of said one part being adhesively and removably attached to the back face of the entire hinge pin, said adhesive face of said other part being adhesively and removably attached to the entire front face of the hinge leaves and the hinge pin with said tab being adhesively and removably attached to the hinge pin, said tab being used to remove said other part from said hinge after the hinge has been coated.

4,796,331
HINGE FOR ROOF WINDOW

Paul S. White, Barnsley, and Michael D. Eaton, Wigan, both of United Kingdom, assignors to GKN Crompton Limited, Lancashire, England

Filed Dec. 30, 1987, Ser. No. 139,723
Int. Cl.[4] E05D *11/06, 11/08, 11/10*
U.S. Cl. 16—324 **12 Claims**



1. A hinge for a window comprising a sash openable relative to a peripheral frame about a pivot axis extending transversely

of the frame in the mid-region between upper and lower edges thereof, said hinge comprising:

a body adapted to be secured to said peripheral frame and affording a first pivot formation;

support means pivotally connected to said body at said first pivot formation and adapted to be connected to said sash to support the latter, said support means also affording a further pivot formation spaced from said first pivot formation to move in an arcuate path thereabout;

a stay member having one end connected to said support means at said further pivot formation and its other end constrained for reciprocation within the body; and

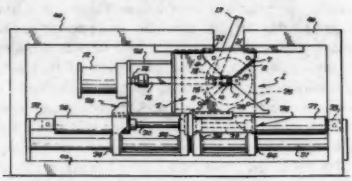
constraining means arranged to engage said stay member within said body to constrain movement thereof at least one operative position of the stay member.

4,796,332

CONSTRICTING AND FASTENING APPARATUS

Thomas R. Stanley, Downers Grove, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Aug. 13, 1987, Ser. No. 85,592
Int. Cl.[4] A22C *11/12*
U.S. Cl. 17—34 **15 Claims**



1. An apparatus for applying a pliable fastener around a tubular article constructed of flexible material comprising co-acting, reciprocally movable, means for circumferentially constricting a 360° arc of said tubular article to form a portion of circumferentially constricted flexible material gathered about the longitudinal axis of said tubular article, said co-acting means further comprising means synchronously reciprocating with said co-acting means, for urging a pliable fastener around said constricted portion of said material, and drive means for constricting said material and urging said pliable fastener.

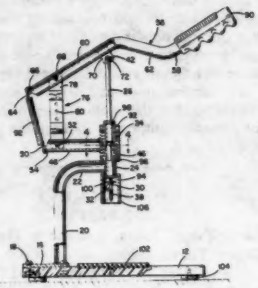
4,796,333

SHELLFISH SHUCKING MACHINE

John L. Stinson, Jr., and George W. Henley, Jr., both of Fairhope, Ala., assignors to Easy Shucker, Inc., Foley, Ala.

Filed Jan. 7, 1988, Ser. No. 141,413
Int. Cl.[4] A22C *29/04*
U.S. Cl. 17—76 **6 Claims**

1. A shellfish shucking machine comprising a stand having a base for supporting a shellfish, said stand including a vertically disposed sleeve oriented above the base, a ram shaft slidably received in said vertical sleeve with a blade mounted on the lower end thereof for penetrating into the seam of a shellfish, a control arm pivotally connected to the upper end of the ram shaft and pivotally attached to the stand for moving the ram vertically, said stand including a pivot arm mounted on said sleeve for rotational movement thereon, said pivot arm including a laterally extending member having the end of the control arm mounted thereon for pivotal movement about a transverse axis with the control arm being rotatable with the pivot arm about the sleeve for rotating the ram shaft and blade about the longitudinal axis of the ram shaft so that the blade can be twisted after penetration into the seam of the shellfish for prying the seam of the shellfish open thereby opening the shellfish.

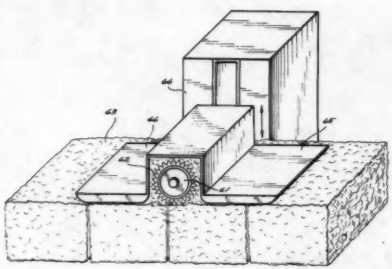


4,796,334

TREATMENT OF COTTON

Herzel B. Yecheskel, 1 Elishu Hanassi Street, Bat Yam; Gad Alon, 14 Hazaz Street, Herzlia, and Eliezer Beck, 40 Wolfson Street, Rishon Lexion, all of Israel

Filed Feb. 26, 1986, Ser. No. 833,987
Claims priority, application Israel, Feb. 27, 1985, 74469
Int. Cl.[4] D01G *37/00, 7/06*
U.S. Cl. 19—0.27 **1 Claim**



1. A device for rendering adhesive honeydew droplets adhering to cotton fibers non-adhesive, and for rendering them brittle and hard, which comprises at least one heated means with which the cotton fibers are brought into contact so that the fibers are heated to a temperature higher than 70° C., for a period of time of from ¼ to about 3 seconds, the heated means being formed as a heated plate which is contacted with the upper surface of cotton bales as cotton tufts are plucked from them by a bale opener, said contact preceding the removal of cotton tufts by the bale opener, the surface temperature of the heated plate being adequate to render honeydew droplets or other sticky substances, non-sticky.

4,796,335

METHOD AND APPARATUS FOR OPENING FIBER BALES

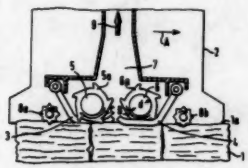
Andreas Krauefeld, Erkelenz, and Josef Temburg, Jüchen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen Gladbach, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 135,523

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643507

Int. Cl.[4] D01G *7/04*

U.S. Cl. 19—80 R **15 Claims**



1. In a bale opener having an opening device arranged for a horizontal back-and-forth travel above a row of fiber bales; said opening device having two parallel-arranged and horizontally oriented opening rollers provided with teeth; said opening rollers being spaced from one another in a direction parallel to the direction of back-and-forth travel; each said opening roller having an axis of rotation oriented perpendicularly to the direction of the back-and-forth travel; said opening device further having a bale hold-down device through which the teeth of the opening rollers project for penetrating into upper faces of the bales and suction means for removing fiber tufts detached by said opening rollers; the improvement comprising means for codirectionally rotating said opening rollers during said back-and-forth travel.

4,796,336

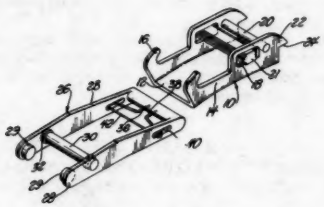
TWO PART BUCKLE

Andrew J. Scully, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1987, Ser. No. 82,880

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—68 CD **1 Claim**



1. A two part overcenter buckle suitable for attachment to the free end of belting to fasten the ends together including: a first buckle member having a base, a pair of buckle sides mounted on opposite edges of the base each of the buckle sides having hook members formed in the sides of the first buckle member, a rectangular slot formed in each buckle side with the longitudinal axis being approximately parallel to the base member, a sliding retention bar extending transversely across the first buckle member with each end of the retention bar having one end mounted within the slot and adapted for movement along the slot, a jam bar having one end attached to each of the sides and extending transversely across the first buckle member near one end of the slot so that the sliding bar can be moved to a belt retaining position, at least one detent formed on the end of the first buckle member nearest the jam bar; and a second buckle member having a pair of complimentary arms permanently joined so the arms are maintained in a spaced parallel configuration, stub shafts are mounted near one end of the second buckle member, the stub shafts being formed so as to extend inward from the sides of the second buckle member and to engage the hook members and allow rotation of the second buckle member when engaged, means for permanently attaching one end of a belt to the second buckle member, a T-shaped spring member having one leg fixed in the second buckle member and having an arm extending transversely across the second buckle member with the ends of the arm moveably mounted in the sides of the second buckle member located at the end of the second buckle member opposite to the second retention means, and adapted to engage the detent on the first buckle member when the first and second buckle members are in a closed position.

4,796,337

DEVICE FOR CLOSING A BOOT

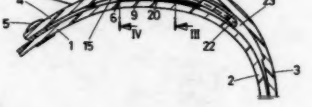
Herbert Marxer, Schaan, Liechtenstein, assignor to Lange International, SA, Switzerland

Filed Feb. 24, 1987, Ser. No. 17,928

Claims priority, application Switzerland, Apr. 25, 1986, 1703/86

Int. Cl.[4] A43C *11/00*

U.S. Cl. 24—68 SK **2 Claims**



1. Device for closing a first and a second part of a boot, comprising a toothed strap fixed to the first part of the boot fastening means which is mounted so as to slide on and around the toothed strap and is provided with a locking device cooperating with the toothed strap in a selected position, and a rectangular buckle which is integral with a tensioning lever hinged to the second part on the boot and which engages said fastening means, wherein the toothed strap has saw teeth, wherein said locking device comprising a a tip and a transverse groove with a hook-shaped profile located above said tip thereby engaging the saw teeth and wherein said buckle and said tensioning lever are hinged with said second part in its middle area and being pressed against said toothed strap after adjustably engaging the pawl.

4,796,338

WIRE TENSIONER

Richard G. Meyers, Euclid, Ohio, assignor to The National Telephone Supply Co., Cleveland, Ohio

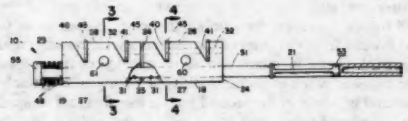
Filed Mar. 17, 1986, Ser. No. 840,035

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—68 R **14 Claims**

1. A device for connecting first and second wire members including first and second block members having upper and lower side portions and first and second end portions, first and second longitudinally extending openings extending respectively through said lower and upper side portions from said first to said second end portions of each of said first and second block members, first and second wires adapted to extend respectively through said first and second openings in each of said first and second block members, first and second releas-

able gripping means located in said upper side portions of each of said first and second block members respectively and associated with said second opening and wire adapted to extend therethrough, said first block member movable relative to said



second block member on the first wire and said releasable gripping means permitting movement of the second wire through said second opening in a given direction and preventing movement in an opposite direction.

4,796,339

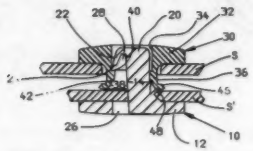
ONE-WAY SNAP FASTENER

James E. Burke, Huntington, Conn., assignor to Scovill Fasteners Inc., New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 156,667

Int. Cl.[4] A44B *1/38*

U.S. Cl. 24—662 **5 Claims**



1. A permanently locking snap fastener comprising:

a. an integrally molded stud head comprising a circular base flange having a plurality of radially disposed thin fins extending up from about the axis of the circular base, the fins having on their upper end a generally circular dome, the dome having from its periphery alternating with the fins a plurality of spaced outwardly and downwardly extending straight barbs, the barbs having flat lower ends; and

b. a socket comprising an annular base flange having a downward-extending sleeve, the sleeve having an upward tapered lead-in opening narrowing as its upper end is approached and above that an outwardly and downwardly inclined annular-bearing surface, the socket also being formed with a cylindrical opening extending from the base flange down to the outer diameter of the bearing surface, the cylindrical opening having approximately the same diameter as the distal ends of the barbs, the junction of the tapered lead-in and the inclined-bearing surface defining a throat having a radius substantially the same as the width of the fins on the stud head, the head and socket being of such relative dimensions that when the head is installed into and through the lead-in opening in the sleeve the barbs will flex inward as they pass the throat and then snap outward so that any subsequent attempt to open the fastener will cause the barbs to butt against the bearing surface and prevent opening.

4,796,340

METHOD OF THREADING A YARN PROCESSING NOZZLE

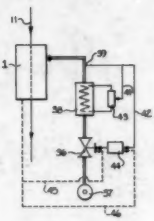
Klaus Gerhards, Hückeswagen, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 921,363

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537321; May 10, 1986, 3615829

Int. Cl.[4] D02G *1/12, 1/16*

U.S. Cl. 28—248 **9 Claims**



1. A method of threading a yarn through a yarn processing nozzle of the type comprising a body member having a yarn passageway extending therethrough, with said yarn passageway having a peripheral side wall, an internal duct in said body member and communicating with said passageway, means for selectively maintaining the peripheral side wall either substantially closed during normal yarn processing or laterally open along the entire length of said passageway to permit the lateral insertion of a yarn thereinto during yarn thread-up, and treatment fluid supply means including heating means for supplying a pressurized and heated treatment fluid to said internal duct and such that the treatment fluid enters said passageway, and comprising the steps of

maintaining the peripheral side wall substantially closed and while supplying a treatment fluid to said internal duct and said passageway, with the treatment fluid having a predetermined operating mass flow rate and a predetermined operating temperature,

laterally opening the peripheral side wall of said passageway to thereby reduce the flow resistance of the nozzle to said treatment fluid;

laterally inserting a yarn into the laterally open passageway, and then

laterally closing the peripheral side wall of said passageway, and

maintaining the mass flow rate and temperature of said treatment fluid substantially at said predetermined operating mass flow rate and predetermined operating temperature during all of the above steps.

4,796,341

PLATE ROUTING METHOD AND APPARATUS

James A. Kuhn, II, York, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 11, 1988, Ser. No. 142,586

Int. Cl.[4] B23Q *7/00;* B65G *47/24;* B23C *9/00*

U.S. Cl. 29—33 P **50 Claims**

1. A plate routing method comprising the steps of:

moving a plurality of plates of equal size onto a conveyor one at a time;

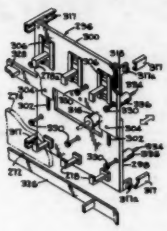
intermittently driving the conveyor for moving each plate in turn into a precision machining station having a power drive cutting tool therein;

lifting the plates off the conveyor for supporting the plates above the conveyor at a precise height relative to the cutting tool;

moving the plates in a direction longitudinally of the con-

veyor to a precise transverse machining position relative to the cutting tool;

clamping the plates at said precise height and in said transverse machining position;



driving the cutting tool to accurately machine the plates;

releasing the machined plates for support on said conveyor; and

moving the machined plates off the conveyor.

4,796,342

PRESS ROLL FOR PAPER MAKING MACHINES

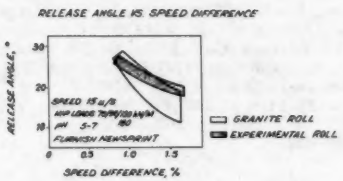
Veijo Miihkinen, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Continuation-in-part of Ser. No. 894,925, Aug. 8, 1986, Pat. No. 4,748,736, which is a continuation-in-part of Ser. No. 816,628, Jan. 6, 1986. This application Aug. 17, 1987, Ser. No. 85,933

Claims priority, application Finland, Sep. 16, 1985, 853544

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—132 **20 Claims**



1. A press roll for paper machines, comprising:

a roll body having a cylindrical exterior formed of metallic material; and

a coating applied over said roll body exterior formed of a material including a mixture of a metallic component and a ceramic component, said coating material having a surface energy within the range of between about 35 to 50 mJ/m^2,

whereby said press roll has generally acceptable web release properties for paper pulp.

4,796,343

GAS TURBINE ENGINE ROTOR ASSEMBLY

Rodney G. Wing, Middlesex, England, assignor to Rolls-Royce plc, London, England

Filed Jul. 23, 1987, Ser. No. 76,832

Claims priority, application United Kingdom, Aug. 1, 1986, 8618786

Int. Cl.[4] B23P *15/02*

U.S. Cl. 29—156.8 R **11 Claims**

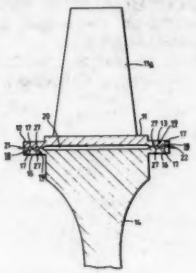
11. A method of manufacturing a rotor assembly for a gas turbine engine comprising the steps of:

fabricating a member of circular cross-section;

fabricating an array of aerofoil shaped blades, each blade comprising an aerofoil portion and a root portion;

mounting each said blade on a radially outer peripheral portion of said member, the root portion of each said blade confronting said member, each said root portion and said member being provided with at least one pair of grooves that cooperate to define first and second enclosed chambers at an interface between said member and each said root portion;

sealing the interface between each said root portion and said



member at a location between the first chamber and a peripheral edge of each said root portion; and

subsequently hot isostatically pressing the resultant assembly thereby to achieve diffusion bonding between each said blade and said member, and to collapse the second chamber thereby to provide a visual indication of success of the diffusion bonding.

4,796,344

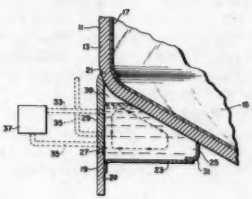
METHOD FOR AVOIDING THERMAL STRESSES IN GLASS LINED VESSELS

Erwin J. Nunlist, Penfield, N.Y., assignor to The Pfaudler Companies, Inc., Rochester, N.Y.

Division of Ser. No. 668,604, Nov. 5, 1984, Pat. No. 4,711,296. This application Sep. 29, 1987, Ser. No. 102,381

Int. Cl.[4] B21D *53/00*

U.S. Cl. 29—157 R **6 Claims**



1. A method of reducing stresses in vertically arranged, cylindrical metal vessels having a side wall, and top and bottom end walls in which the side and bottom walls are connected by a knuckle radius, said method comprising the steps of:

(a) forming a heat transfer compartment at the lower end of said vessel by attaching an annular support skirt to said side wall contiguous to said knuckle radius and extending around the periphery of the vessel and downwardly beyond the contour of said bottom end wall, said support skirt having sufficient dimensional stability to support said vessel in a vertical position;

(b) enclosing the annular space between the interior portion of the skirt and the exterior bottom end wall of the vessel, said heat transfer compartment surrounding said knuckle radius, and

(c) filling, at least partially, said heat transfer compartment

with a heat transfer medium to form a heat transfer sump for transferring heat from the bottom portion of said vessel to the outer portions of said annular heat transfer compartment.

4,796,345

METHOD OF FABRICATING A RIM GEAR, SUCH AS A STARTER RIM GEAR MADE OF SHEET METAL

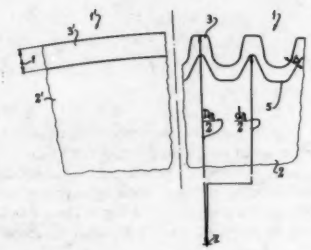
Hans Krapfenbauer, Zürich, Switzerland, assignor to Ernst Grob AG, Männedorf, Switzerland

Filed Jul. 20, 1987, Ser. No. 75,123

Claims priority, application Switzerland, Jul. 24, 1986, 02966/86

Int. Cl.[4] B21D *53/28*

U.S. Cl. 29—159.2 **4 Claims**



1. A method of fabricating a rim gear, especially a starter rim gear, made of sheet metal, comprising the steps of:

cold forming a substantially cylindrical rim portion of a dished blank according to the Grob method to produce a gear tooth system possessing predetermined gear wheel meshing characteristics and containing an external gear tooth system and an internal gear tooth system;

said step of cold forming entailing reducing an outside diameter of said substantially cylindrical rim portion of said dished blank such that:

(a) the quotient of the difference between an addendum circle diameter of said external gear tooth system of the fabricated rim gear and a crown circle diameter of said internal gear tooth system of the fabricated rim gear divided by a predeterminate wall thickness of said substantially cylindrical rim portion of said dished blank before said step of cold forming is at least 1.6; and

(b) the quotient of a thinnest portion of a tooth flank wall of the fabricated rim gear divided by said predeterminate wall thickness of said substantially cylindrical rim portion of said dished blank before said step of cold forming is at most 0.4.

4,796,346

VEHICLE BODY POSITIONING APPARATUS

Yoshinobu Kawasaki; Ryo Niikawa, and Yuzi Ikeda, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 67,171

Claims priority, application Japan, Jun. 30, 1986, 61-151735

Int. Cl.[4] B23D *21/00*

U.S. Cl. 29—700 **3 Claims**

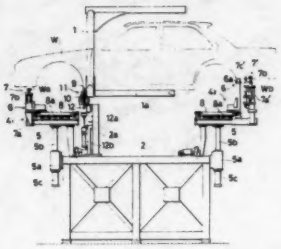
1. Apparatus for positioning a vehicle body comprising:

a hanger for conveying a vehicle body, said hanger having a pair of left and right sections adapted to support said vehicle body,

a pair of locating pins with each locating pin on one of said left and right sections of said hanger and engaging respective apertures in said vehicle body to locate said vehicle body relative to said hanger,

a pair of left and right standard pins with each standard pin projecting down from respective ones of said left and right sections of said hanger,

a machine base located at a work station stop position below said conveying hanger, and



means on said base including left and right clamp means arranged to clamp respective ones of said left and right standard pins and thereby position said hanger at a predetermined position relative to said machine base.

4,796,347

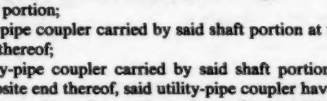
PLASTIC-PIPE PULLING TOOL

Domingo V. Aguillen, Jr., 7485 Fillmore Dr.; Pete P. Casares, 6324 Sherman Way; John E. DeForrest, 7152 El Veloz Way, all of Buena Park, Calif. 90620; Kevin C. Green, 6425 Belen Ave., Long Beach, Calif. 90815; Rocque A. Kavanagh, 4238 61st St., Los Angeles, Calif. 90043; Bryan Wilkinson, 4113 169th St., Lawndale, Calif. 90260; Marc K. Marks, 2507 Feijoa Ave., Lomita, Calif. 90717, and Gerardo Zuniga, 24511 Albatross Ave., Wilmington, Calif. 90744

Filed Oct. 27, 1987, Ser. No. 113,064

Int. Cl.[4] F16G *11/05*

U.S. Cl. 29—280 **5 Claims**



1. A puller tool for installing plastic utility pipe having either first or second inner-wall diameters, including:

a shaft portion;

a bore-pipe coupler carried by said shaft portion at the first end thereof;

a utility-pipe coupler carried by said shaft portion at the opposite end thereof, said utility-pipe coupler having first and second coupling sections, the maximum outside diameter of said first coupling section being such as to form a snug fit with the inner-wall of said utility pipe of said first inner-wall diameter, said second coupling section having a maximum outside diameter which is such to form a snug fit with the inner-wall of said utility pipe of said second inner-wall diameter, said first coupling section being closer to said bore-pipe coupler than is said second coupling section;

said first and second coupling sections having tapered segments and carrying threads along at-least-a-portion of such tapered segments; and,

a location-wire connector loop fixedly carried by said shaft.

4,796,348

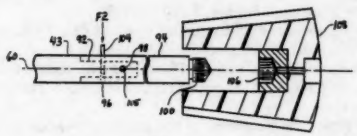
METHOD AND MEANS FOR ADAPTING PLUMBING VALVE STEMS TO DESIRED TRIM

Richard A. Rosen, 3934 Corbin Ave., Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 808,270, Dec. 12, 1985, Pat. No. 4,670,959. This application Jun. 5, 1987, Ser. No. 58,401

Int. Cl.[4] B21K *21/16*; B23P *17/04, 19/04*

U.S. Cl. 29—401.1 **19 Claims**



1. A method of adapting plumbing trim having a keyway of a first type with a stem of a plumbing valve, said stem having an end that does not match the first type of keyway of the plumbing trim, said method comprising the steps of

(a) drilling a first connection means into the end of said stem;

(b) connecting an adaptor to said first connection means, said adaptor having a spline at a first end thereof that matches the keyway of the first type of said plumbing trim, and said adaptor further having a second connection means at a second end thereof that connects with the first connection means drilled into said stem; and

(c) joining the keyway of the plumbing trim with the spline at the first end of the adaptor.

4,796,349

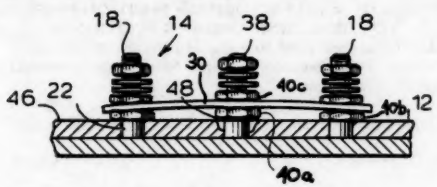
METHOD OF REPAIRING A BINDING POST

Douglas J. Miller, 1319 Pulaski St., Riverhead, N.Y. 11901

Filed May 22, 1987, Ser. No. 53,099

Int. Cl.[4] B23P *6/00*

U.S. Cl. 29—402.08 **1 Claim**



1. A method for repairing a damaged binding post in a telephone connecting panel having a mounting board on which a plurality of spatially arrayed binding posts are mounted comprising the steps of removing said damaged binding posts, mounting a replacement binding post in the position of said damaged posts, applying a retaining means to the lower end of said replacement post at a point spaced from the surface of said mounting board, placing a bridging plate over the replacement post and extending over the laterally adjacent binding posts, and pressing and retaining the ends of said bridging plate downwardly to cause said bridging plate to react against said retaining means to force said replacement binding post conjointly into the mounting panel.

4,796,350

METHOD OF USING PORTABLE APPARATUS FOR UNITIZING ROOF SCHEMES

Christopher W. French, 27614 Renwick Ct., Saugus, Calif. 91350

Filed Feb. 24, 1987, Ser. No. 18,488

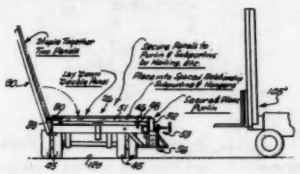
Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—432 **8 Claims**

1. A method of forming a unitized roofing scheme including joined panels, a major beam having a top, and minor beams having tops, comprising

securely mounting the major beam to a flat edge on a rectangularly-configured jig,

placing in transversely spaced parallel relationship to one another the minor beams by mounting them in fixed positions in the jig perpendicular to the flat edge, the tops of said major and minor beams being substantially flush and planar withh one another by such placing,



laying at least two panels atop the minor beams with edges thereof over the centerline of a minor beam,

aligning the laid panels on the jig so that an exposed edge of the panels overhangs the placed minor beams to the extent of aligning the exposed edge upon the centerline of the securely mounted major beam, and

securing the panels, minor beams and major beam together.

4,796,351

GASKETS

Colin Gee, Mirfield, England, assignor to Flexitallic Limited, Manchester, England

Filed May 12, 1983, Ser. No. 494,015

Claims priority, application United Kingdom, May 18, 1982, 8214453

Int. Cl.[4] B81D *39/00*

U.S. Cl. 29—455.1 **1 Claim**

1. A method of making a spiral wound gasket having improved elastic recovery comprising the steps of:

(1) profiling a strip of an-annealed high tensile strength, precipitation hardening grade of alloy steel strip into a spiral wound gasket profile, followed by

(2) heat treating the strip and thereafter

(3) winding and interleaving it with a strip of a sealing material into a spiral wound gasket.

4,796,352

AC SERVOMOTOR AND A METHOD OF MANUFACTURING THE SAME

Shigeki Kawada; Yoichi Amemiya; Masatoyo Sogabe, all of Hachioji, and Noboru Iwamatsu, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Divison of Ser. No. 772,600, filed as PCT JP85/00829 on Dec. 28, 1984, published as WO85/03172 on Jul. 18, 1985, abandoned. This PCT application Dec. 28, 1984, Ser. No. 51,268

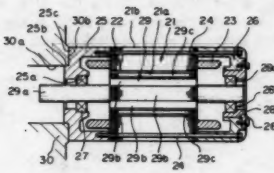
Claims priority, application Japan, Dec. 29, 1983, 58-247742

Int. Cl.[4] H02K *15/14*

U.S. Cl. 29—596 **3 Claims**

1. A method of manufacturing an AC servomotor, comprising the steps of: laminating a plurality of magnetic steel plates to form a stator core having a center bore and slots for receiving coils; selecting at least one datum surface comprised of either the inner surface of said center bore or the outer circumference of said stator core ; loading stator coils in said stator core slots; securing a pair of brackets to the axial opposite ends of said stator core respectively to provide an assembly for rotatably supporting a rotor in bearing members thereon; machining each of said brackets to form bearing member mounting bores therein concentric with said selected datum surface

of said stator core to form an outer mounting surface on one of said brackets which is perpendicular to said selected datum surface of said stator core; and rotatably supporting a rotor and shaft internally of said stator core center bore, said shaft being



rotatably mounted in bearing members fit to said bearing member mounting bores of said brackets whereby said rotor and shaft will be concentric with said selected datum surface of said stator core and normal to said outer mounting surface.

4,796,353

PROCESS FOR PRODUCING AN ELECTRIC ARBOR INTEGRATED WITH AN INDUCTION MOTOR

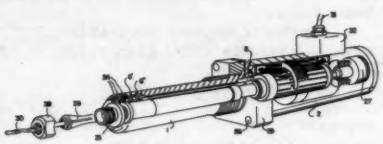
Elis Mantovani, Cadempino, Switzerland, assignor to Tecnodelta S.A., Manno, Switzerland

Filed Jul. 29, 1987, Ser. No. 79,029

Claims priority, application Switzerland, Nov. 24, 1986, 4690/86

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 **1 Claim**



1. A process for manufacturing a stator (4, FIG. 2 or FIG. 5) and a rotor (5, FIG. 2 or FIG. 9) of an electric arbor, comprising by the following steps:

(a) providing laminations (FIG. 6) with a thickness less than that normally used;

(b) dimensioning said laminations with the minimum thickness of an outside ring (7, FIG. 6) of the stator;

(c) dimensioning stator slots (8, FIG. 6) to have the maximum thickness of the tooth (9, FIG. 6 and 7) by providing slot insulation (10, FIG. 7) with insulation having high resistivity and less than normal thickness;

(d) providing at each end of a stator core stack (4', FIG. 8) a washer (11, FIG 8) of a material having a high thermal conductivity, superficially insulating and equal in shape to that of the laminations (FIG. 6), which transmits the heat from said stator stack (4', FIG. 8) to an outside stator frame (12, FIG. 2 or FIG. 5) of a material having high thermal conductivity that is provided with a cooling system;

(e) introducing in the stator slots (8, FIG. 6) windings (13, FIG. 5 and FIG. 7) of wire of a material with high electrical conductivity and superficially insulated;

(f) inserting in said frame (12, FIG. 2 or FIG. 5) the wound stator (4, FIG. 2), a front flange (12', FIG. 2 or FIG. 5) and a back flange (12'', FIG. 2 or FIG. 5);

(g) introducing insulating resin (14, FIG. 5 and FIG. 7) so that it comes to occupy all the interstices of the winding, thereby replacing the air which was present before this operation is performed, said resin being relatively elastic and undergoing an increase in its elasticity with an increase of temperature and being charged with substances that increase the thermal conductivity of the resin so as:

to increase the insulation between the coils of the winding (13, FIG. 5 and FIG. 7) within the stator slots (8, FIG. 6) and in the ends of the stator;

to make the winding (13, FIG. 5 and FIG. 7) hermetically sealed to infiltrations of liquids or minute metal particles;

to define with precision the geometry of the overhangs of the winding (13, FIG. 5 and FIG. 7);

to keep the conductors of the winding (13, FIG. 5 and FIG. 7) from being able to vibrate;

to increase the evacuation of heat from the stator (4, FIG. 2 and FIG. 5) to the outside frame (12, FIG. 2 and FIG. 5); and

to increase the resistance of the motor to overloads, even extended overloads without suffering damage;

(h) making the rotor core stack (5, FIG. 2 and FIG. 9) by using thin laminations (FIG. 10), inorganically insulated and having a hole (15, FIG. 10) for a larger than normal shaft, by using for this purpose conductors (16, FIG. 9 and FIG. 11), for a squirrel cage, with very low resistance and melted on the ends to achieve short-circuit rings (19, FIG. 9);

(i) placing on each end of the rotor (5, FIG. 2 and FIG. 9) a washer (17, FIG. 9) of a material having a high mechanical and amagnetic resistance, provided with ducts (18, FIG. 9) to feed in a damping resin (22, FIG. 9) to eliminate the vibrations of the conductors; melting the terminals of the conductors (16, FIG. 9 and FIG. 11) to obtain the respective short-circuit rings and successively to each short-circuit ring applying a housing (20, FIG. 9), also of a material having high mechanical and amagnetic resistance, welded (12, FIG. 9) to said washer (17, FIG. 9), without additional material, to contain the centrifugal effect to which the ring is subjected, given the very notable centrifugal force that is generated at high frequencies.

4,796,354

METHOD OF MANUFACTURING A POSITION SENSOR FOR DETECTING ANGULAR POSITION

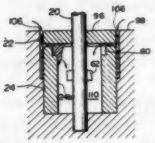
Toshio Yokoyama; Iwao Shimane, and Tsuneo Konno, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 27,832

Claims priority, application Japan, Mar. 19, 1986, 61-63404

Int. Cl.[4] H01F *41/02*

U.S. Cl. 29—608 **11 Claims**



1. A method of manufacturing a position sensor for measuring angular position of a rotating shaft, comprising:

(a) fabricating a hollow tubular member made of a magnetic material;

(b) disposing a center shaft inside the tubular member coaxially thereto, said tubular member being synchronously rotatable with the rotation of the shaft to be measured through said center shaft;

(c) placing said tubular member and said shaft disposed therein in a die surrounding both said tubular member and said shaft and injecting resin into said die such that said resin is first directed onto the oter surface of said tubular member so as to exert inward-acting compressive stress on

at least a portion of the outer surface of said tubular member;

(d) injecting resin then into the die such that said resin is directed into the interior of said tubular member between an inner surface of said tubular member and said center shaft to affix said shaft to said tubular member while balancing exerted outward-acting tensile stress with the compressive stress; and

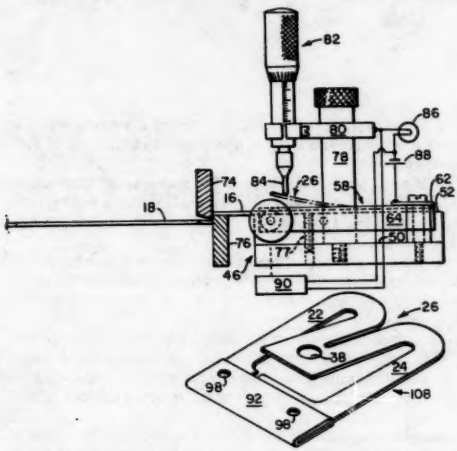
(e) forming magnetic poles on an outer surface of said tubular member for generating a signal indicative of the angular position in cooperation with a magneto electric transducer means provided on a member positioned independent of rotation.

4,796,355

SNAP ACTION DEVICES AND METHODS AND APPARATUS FOR MAKING SAME

Lyndon W. Burch, Boston, Mass., and Hadley K. Burch, Pittsfield, Vt., assignors to B/K Patent Development, Inc., Los Angeles, Calif.

Filed Sep. 15, 1987, Ser. No. 96,468
Int. Cl.[4] H01H *11/00, 65/00*
U.S. Cl. 29—622 **17 Claims**



1. A method of forming an inherently mechanically bistable element comprising the steps of

forming a blade element blank from a substantially flat, unstressed sheet of spring material to include at least two legs and a bridging portion integrally connecting one end of each leg to one end of the other,

supporting the blade element blank in a fixture adapted for controlled relative displacement of the other ends of said two legs in the nominal plane of said element,

progressively relatively displacing said other ends while detecting the deflection of the bridging portion normally to said plane,

arresting said relative displacement upon said detected deflection reaching a predetermined magnitude, and

rigidly attaching together said other ends in their relative positions at the arrest.

4,796,356

PROCESS FOR MAKING CLOSE TOLERANCE THICK FILM RESISTORS

Thomas Ozaki, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Aug. 27, 1987, Ser. No. 90,193
Int. Cl.[4] H01C *17/06*
U.S. Cl. 29—620 **10 Claims**

1. A process for manufacturing close tolerance thick film resistors on a ceramic dielectric substrate comprising the steps of:

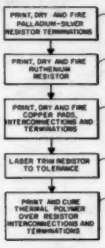
printing at least first and second resistor terminations to said dielectric substrate using a precious conductor material;

fixing said resistor terminations to said dielectric substrate by air drying and air firing said said resistor terminations;

printing a resistive material to portions of said first and second resistor terminations and to said dielectric substrate intermediate said first and second resistor terminations;

fixing said resistive material to said first and second terminations and said dielectric substrate by air drying and air firing said resistive material;

printing, using a base conductor material, at least first and second terminal pads and first and second conductor traces to said dielectric substrate, said first and second conductor traces extending from said first and second terminal pads respectively to at least first and second resistor interconnections, said first and second resistor


PRINT, DRY AND FIRE PALLADIUM-SILVER RESISTOR TERMINATIONS
10
PRINT, DRY AND FIRE RUTHENIUM RESISTOR
12
PRINT, DRY AND FIRE COPPER PADS, INTERCONNECTIONS AND TERMINATIONS
14
LASER TRIM RESISTOR TO TOLERANCE
16
PRINT AND CURE THERMAL POLYMER OVER RESISTOR INTERCONNECTIONS AND TERMINATIONS
18

interconnections printed to said first and second resistor terminations and to portions of said resistive material;

fixing said first and second terminal pads, first and second conductor traces and first and second resistor interconnections by air drying and firing in nitrogen;

printing a dielectric encapsulant substantially over said first and second resistor interconnections and resistive material; and,

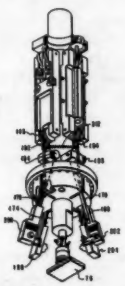
curing said dielectric encapsulant using a thermal source.

4,796,357

METHOD AND APPARATUS FOR POSITIONING ELECTRICAL COMPONENTS

Ted M. Smith, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1988, Ser. No. 155,773
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—840 **20 Claims**



1. A placement head assembly for placing an electrical component on a circuit board, comprising:

a main shaft defining an outer surface extending about a longitudinal axis;

vacuum support means for releasable support of said component; and

alignment means for aligning said component relative to said axis, said alignment means including carriage means carrying actuator means for urging said carriage means along said axis in response to fluid pressures and having upper and lower roller means engaging said outer surface.

4,796,358

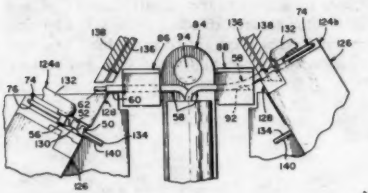
METHOD AND APPARATUS FOR ASSEMBLY OF ELECTRICAL CABLE

Alden O. Long, Jr., Carlisle, and Robert Volinskie, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 905,902, Sep. 10, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 169,787

Int. Cl.[4] H01R *43/04*; B23P *19/00*

U.S. Cl. 29—863 7 Claims



1. A method for assembling an electrical cable assembly comprising first and second section means having groove means extending from end to end and outwardly projecting rib means extending alongside said groove means, said groove and rib means on said first section means being laterally shifted relative to said groove and rib means on said second section means and electrical contact means for being disposed in said groove means, said method comprising the steps of:

spreading a plurality of wires outwardly in two opposite directions;

trimming said wires to predetermined lengths and stripping insulation from the ends thereof to bare a conductor therein;

terminating said bared conductors to said electrical contact means;

placing said contact means attached to said wires extending outwardly in one of said two opposite directions

in said groove means in said first section means; placing said contact means attached to said wires extending outwardly in another of said two opposite directions in said groove means in said second section means; and

forming said electrical cable assembly by joining said first and second section means together with said rib means on said first and second section means entering respective said groove means in said first and second section means to cooperatively form passageway means with said contact means therein and said wire attached thereto extending outwardly therefrom.

4. An apparatus for use in assembling an electrical cable assembly of the type formed by bringing first and second sections together with each section having wire-terminated electrical contacts therein, said apparatus comprising:

support means:

a pair of arm means with each having transverse grooves on one surface, said arm means mounted on said support means in parallel relation and pivotally movable from a first position where said grooved surfaces are facing in the same direction to a second position where said grooved surfaces are facing each other;

cable retaining means mounted on said support means for retaining an electrical cable therein; and

crimping means for crimping the electrical contacts to wires extending through said transverse grooves when said arm means are in a first position.

4,796,359

ELECTRIC SHAVING APPARATUS WITH A PIVOTED SHEARING HEAD SYSTEM

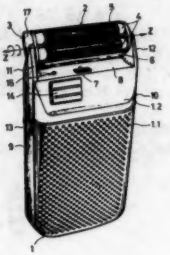
Klaus Oprach, Schwalbach; Lühr Harms, Oberursel; Gebhard Braun, Keilheim, and Karl Tröltsch, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,304

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610736

Int. Cl.[4] B26B *19/04*

U.S. Cl. 30—43.92 16 Claims



1. An electric shaving apparatus having a housing, a motor in said housing, and a pivot axis located at one end of said housing, and

a shearing head system mounted on said housing for pivoting movement about said pivot axis, said shearing head system comprising a shearing head frame having opposing longitudinal sides

at least one upper cutter that includes two arcuate cutter extension portions extending along substantially the entire length of each longitudinal side of said shearing head frame,

at least one under cutter drivingly coupled to said motor and in cooperative relation to said upper cutter, said under cutter including arcuate extension portions in cooperative relation with said arcuate cutter extension portions of said upper cutter,

said shearing head frame defining a shearing plane that is tangent to both of said arcuate cutter extension portions along spaced tangent lines extending longitudinally of said shearing head frame, and said pivot axis being disposed in said shearing plane to at the center of the distance between the longitudinally extending tangent lines that define said shearing plane.

4,796,360

MOTOR-DRIVEN CHAIN SAW WITH A SPROCKET GUIDE

Manfred Fischer, Asperg; Klaus Dussler, Weinstadt; Wilfried Linke, Winnenden, and Werner Hartmann, Ostfildern, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Oct. 29, 1987, Ser. No. 114,657

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640846

Int. Cl.[4] B23B *57/02*

U.S. Cl. 30—384 16 Claims

1. A guide bar and saw chain assembly for a motor-driven chain saw, the assembly comprising:

a guide bar having upper and lower edges and a nose sprocket mounted in the forward end thereof;

said nose sprocket having a plurality of teeth and each two mutually adjacent ones of said teeth conjointly defining a V-shaped tooth gap having an opening angle;

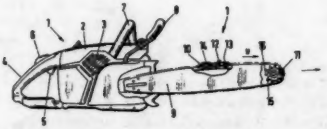
one of said two mutually adjacent teeth being a forward tooth when viewed in the direction of the movement of said saw chain and the other one of said teeth being a rearward tooth, said rearward tooth having a forward flank and said forward tooth having a rearward flank;

a plurality of links pivotally interconnected by rivet pins or the like to form an endless saw chain guided on said guide bar on said edges and on said nose sprocket;

a first portion of said links being cutting links and a second portion of said links being drive links;

each one of said cutting links including; a plate-like cutting-link body having an upwardly extending rearward portion defining a cutting tooth; and, a forward upwardly extending portion defining a depth limiter;

each one of said drive links being a triangularly-shaped plate-like body havig a forward bore and a rearward bore formed therein for accommodating two of said pins to define respective pivot axes;



each of said drive links having two downwardly extending inclined flanks for engaging said tooth gaps and said two downwardly extending inclined flanks having respective contours which extend asymmetrically with respect to a partition line drawn approximately perpendicularly to and approximately bisecting a connecting line passing through said pivot axes;

one of said inclined flanks being a forward flank which defines a forward flank angle (VFW) with said partition line and is in contact engagement with said forward flank of said rearward tooth; the other one of said inclined flanks being a rearward flank which defines a rearward flank angle (HFW) with said partition line and is in contact engagement with said rearward flank of said forward tooth; and, said forward flank angle (VFW) being greater than said rearward flank angle (HFW); and,

said forward flank angle and said rearward flank angle conjointly defining an angle greater than said opening angle.

4,796,361

WELDING ELECTRODE CAN OPENER

Kyle R. Neal, Rte. 1, Box 63, Gibson, Ga. 30810

Filed Feb. 12, 1988, Ser. No. 155,583
Int. Cl.[4] B26F *1/02*
U.S. Cl. 30—447 **1 Claim**

1. A new and improved welding electrode can opener, comprising:

an elongated rectangular base plate;

four upstanding walls forming a can receiving box on a central to portion of said base plate;

four upstanding elongated right angle corner rails mounted at corner portions of said can receiving box;

four side support braces connecting said corner rails, said support braces forming a square and secured at a midpoint of said corner rails;

a pair of "L"-shaped side support rails on opposite ends of said elongated base plate, each of said side support rods having a first end secured to one of said side support braces and an opposite end secured to said base plate;

a square top guide plate mounted on upper ends of said four corner rails;

a pair of circular guide apertures formed through said top guide plate;

a pair of slide bearings mounted on an underside of said guide plate in registry with said guide apertures;

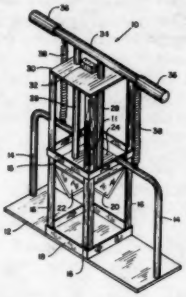
a pair of elongated circular slide rods extending through said guide apertures and slidably mounted in said slide bearings;

a transversely extending cross bar secured to upper ends of each of said slide rods;

a pair of handle grips disposed on opposite ends of said cross bar;

a resilient shock absorbing block secured to an upper service of said top guide plate between said guide apertures;

an elongated ejector pin extending downwardly from a bottom surface of said top guide plate;



a square blade mounting plate connected to bottom ends of said slide rods;

a central circular ejection apertured formed through said blade mounting plate;

four triangular shaped cutting blades formed form tempered steel and having a thickness of about one sixteenth of an inch secured along side edges of said blade mounting plate, each of said blades extending perpendicularly downwardly from said blade mounting plate; and

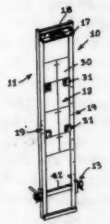
a pair of coil springs connected between said side support rods and said cross bar.

4,796,362

COMBINED CENTERLINE TARGET AND GRADE CHECKER APPARATUS

Jack W. Shoemaker, 9430 Woodsboro Pike, Walkersville, Md. 21793

Filed Aug. 27, 1987, Ser. No. 89,809
Int. Cl.[4] G01C *15/00*
U.S. Cl. 33—1 H **7 Claims**



1. A combined centerline target and grade checker apparatus for use with a laser beam generating device, and a pipe segment for verifying the proper grade of a pipe trench and aligning a pipe segment in a pipe string, wherein the apparatus comprises:

a framework unit including a generally elongated rectangular open framework member comprising a pair of elongated apertured vertical leg elements connected together

on their upper and lower ends by cross-piece elements; wherein, each of the vertical leg elements comprise a generally L-shaped angle iron segment wherein the sides of the angle iron segment are provided with a plurality of equidistantly spaced and vertically aligned apertures and the face of the angle iron segment is provided with indicia representative of vertical height;

a target unit operatively associated with said framework member, wherein said target unit is provided with at least one horizontally disposed reference line and further includes releasable locking means for selectively positioning the target unit on said framework unit; and,

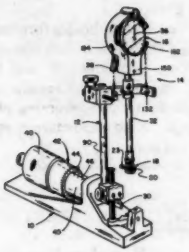
a movable support unit operatively associated with said framework unit and comprising a support member having a pair of elongated horizontally and rearwardly disposed members adapted to engage the interior surface of a pipe segment, and further including releasable locking elements for selectively positioning the movable support unit relative to said framework unit.

4,796,363

MEANS FOR SUPPORTING A GAGING DEVICE SUCH AS A DIAL BORE GAGE DURING THE SETTING THEREOF

Harold T. Rutter, Kirkwood, and Joseph F. Ondrus, St. Louis, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Jan. 11, 1988, Ser. No. 142,192
Int. Cl.[4] G01B 5/12
U.S. Cl. 33—164 R **24 Claims**



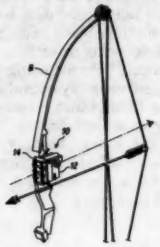
1. Means for supporting a dial bore gage in position to be adjusted on a setting fixture, the gage having a dial portion a work engaging portion with spaced opposed gage contacts and means connected therebetween, the setting fixture having a base for supporting aligned fixed and adjustable fixture members each having a gage contact engaging fixture surface thereon, the improvement comprising a support structure for mounting on the setting fixture in position extending upwardly from adjacent to the space formed by and between the fixture contact engaging surfaces, the support structure including an upright member having gage support means mounted thereon for cooperative engagement with the dial portion of the gage for supporting the gage in position with the work engaging portion extending downwardly from the dial portion in suspended condition into the space defined by and between the fixture contact engaging surfaces with the gage contacts located between the fixture contact engaging surfaces, said support structure having first means associated with the upright member adjustable to change the vertical position of the gage support means and the gage supported thereon and second means associated with the gage support means adjustable to change the horizontal position of the gage on the support structure to predeterminately position the gage contacts between the fixture contact engaging surfaces.

4,796,364

PENDULUM BOW SIGHT

Joseph A. Amacker, Rte. 3, Box 41, Tallulah, La. 71282

Filed Jan. 5, 1988, Ser. No. 141,041
Int. Cl.[4] F41G 1/46
U.S. Cl. 33—265 **33 Claims**



1. A pendulum bow sight comprising:

a sight housing;

a pendulum sight mounted within said sight housing;

a sight window disposed on said sight housing, said sight window adapted to have a plurality of sighting pins mounted thereon; and

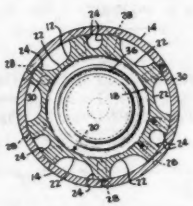
means for moving said sight window relative to said sight housing between a first position in which said sighting pins are located within the line of sight of said sight housing and a second position in which said sighting pins are located outside the line of sight of said sight housing.

4,796,365

UNDERWATER COMPASS SENSOR WITH COMPASS DITHER

Brian R. Hudson, Dallas, Tex., assignor to Whitehall Corporation, Dallas, Tex.

Filed Oct. 5, 1987, Ser. No. 104,379
Int. Cl.[4] G01C 17/32
U.S. Cl. 33—356 **8 Claims**



1. Underwater compass heading sensor and compass dither apparatus for marine seismic wherein the heading sensor includes a remote reading compass, compass heading sensing means, and interrogating circuitry associated with the heading sensor means to periodically provide a trigger pulse for interrogating the heading sensing means and to provide compass heading signals indicative of the heading of the compass at the time of interrogation; the apparatus comprising a housing for the magnetic compass heading sensor defining a chamber receiving the heading sensor therein and having a circumscribing coil-receiving recess, a dither coil comprising a plurality of electrically conductive coil windings in said recess encircling the portion of the housing in which the heading sensor is positioned, and electronic dither circuitry comprising means for producing a dither pulse having a preselected time relation with periodical interrogation of the heading sensor and causing

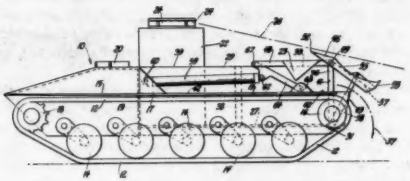
current to be passed through the dither coil around the compass in a first direction for a preselected time duration to activate the coil to provide a light magnetic field causing the compass to move slightly to overcome any effects of static friction which might affect accuracy of compass heading signals upon interrogation.

4,796,366

PLOW/SCRAPER ASSEMBLY FOR EARTH MOVER VEHICLE

Robert M. Scully, 39290 Tunstall Dr., Mt. Clemens, Mich. 48044

Filed Feb. 27, 1987, Ser. No. 20,046
Int. Cl.[4] E02F 3/65, 3/815
U.S. Cl. 37—4 **18 Claims**



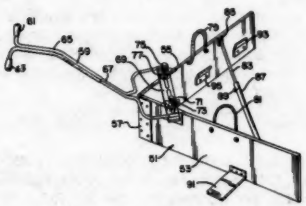
12. An earth-mover comprising: a containment bowl having a side opening; a door swingable about a first axis on the bowl so that the door can alternately serve as a side wall of the bowl or as a ramp to convey earth to the bowl; and a blade swingably connected about a second axis to the door so that the blade can serve a plowing function or serve to shovel material onto the door when the door is acting as a ramp.

4,796,367

ADJUSTABLE, MANUAL SNOWPLOW

Andrew C. Kulst, 94 Petticoat La., Lebanon, N.J. 08833

Filed Jul. 28, 1987, Ser. No. 78,906
Int. Cl.[4] E01H 5/06
U.S. Cl. 37—273 **6 Claims**



1. An adjustable, manual snowplow, which comprises:

(a) a pair of elongated blade panels each of said panels having a substantially vertical plane blade surface, a leading end, a trailing edge, a top and a bottom, said panels being connected to one another in a hinged fashion at their leading ends so as to open and close relative to one another to form a vee shape;

(b) at least one set of hinges attached to the leading ends of the pair of elongated blade panels on the inside of the vee;

(c) a width adjustment member connecting said pair of panels to one another towards their trailing end so as to establish a plow path width, said adjustment member being at least partially removable so as to permit said panels to be folded into one another;

(d) a rigid plow head located on the outside of the leading end of both of said panels and attached to only one of said panels so as to permit said panels to be folded into one another;

(e) drive handle attachment means located on said panels toward the leading end of said panels;

(f) a drive handle attached to said drive handle attachment means, said drive handle being located forward of said leading ends of said panels and having adequate length to permit manual pushing by an operator located in front of said leading ends of said panels;

(g) at least one handle centrally located on a panel to enable said snowplow to be carried manually when folded; and,

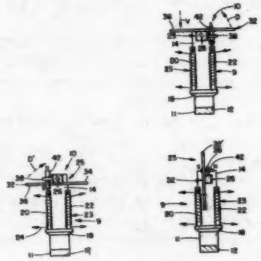
(h) blade edges located at the bottom of each of said pair of panels.

4,796,368

CHANGEABLE DOT DISPLAY ASSEMBLY

Alfred Skrobisch, 64 Fulton Blvd., Commack, N.Y. 11725

Filed Jun. 1, 1987, Ser. No. 56,438
Int. Cl.[4] G09F 9/00
U.S. Cl. 40—449 **11 Claims**



1. A changeable dot display assembly for a portion of a matrix of dots in a variable message sign, comprising:

a stationary support;

a pair of substantially parallel reversely magnetizable magnetic core means carried by said support in an axial position;

wire coil means wound on said core means to magnetize the same when said coil means are electrically energized; and

a rotor carried by said support, said rotor comprising:

a shaft mounted to rotate on an axis perpendicular to and axially spaced from said core means and midway thereinbetween

a permanent magnet mounted to rotate with said shaft, said magnet having at least one magnetic pole axially positioned from said core means and disposed for attraction and repulsion by magnetized ends of at least one of said core means when said core means are magnetized by said coil means to rotate said rotor selectively to three different positions with respect to a viewing position, two of said three positions being substantially 180 degrees apart and the third position lying between said two positions; and

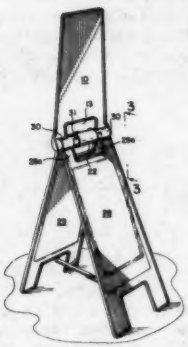
dot display means carried by said shaft, said display means having areas of different colors for selective display in said viewing position depending on the polarities of said ends of said core means when magnetized.

4,796,369

FLOOR SIGN EXTENSION ATTACHMENT

David L. Hamann, Cincinnati, Ohio, assignor to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Jul. 6, 1983, Ser. No. 511,259
Int. Cl.[4] G09F *15/00*
U.S. Cl. 40—606 10 Claims



1. A self-standing floor sign comprising:

a first floor sign panel having an upper end and a lower end;

a second floor sign panel having an upper end and a lower end;

means for hingably connecting said first floor sign panel to said second floor sign panel at said upper ends for selectively positioning apart said lower ends of said floor sign panels relative to each other;

a transverse handle integrally associated with said means for hingably connecting;

an extension panel;

means for pivotally connecting said extension panel to said handle, said means being coaxial with said means for hingably connecting; and,

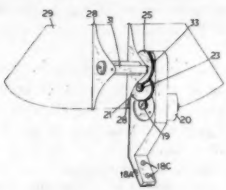
means for selectively positioning said extension panel upwardly relative to said first and second floor sign panels when said lower ends of the latter are positioned apart relative to each other.

4,796,370

NUMERICAL DISPLAY MODULE

Kwangling Chang, 293 Kenilworth Avenue, Toronto, Ontario M4L 3S9, Canada

Filed Apr. 30, 1987, Ser. No. 44,301
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—450 3 Claims



1. In a seven-segment numerical display module, each segment comprising

a support block member directly mounted on a rectangular support board having a flat surface, said support block member having an upper portion extending at an acute angle above said flat surface, and said support block member having a side surface extending at a right angle to said flat surface of said support board,

an extra low voltage direct current motor mounted in an opening formed in said upper portion of said support block member, and having a rotatable shaft extending perpendicular to said side surface of said support block member,

a drive gear means directly mounted on said rotatable shaft of said direct current motor, said drive gear means having a predetermined diameter,

a transmission gear means having a freely rotatable shaft directly mounted on said support block member, said transmission gear means having a first gear means rotatably engaged with said drive gear means, and said first gear means having a diameter substantially larger than the diameter of said drive gear means, and said transmission gear means having a second gear means mounted on said freely rotatable shaft and operatively rotatable with said first gear means, said second gear means having a diameter substantially smaller than the diameter of said first gear means,

a second freely rotatable shaft directly mounted on said support block member,

a rotary gear means mounted on said second freely rotatable shaft and rotatably engaged with said second gear means, said rotary gear means having a diameter substantially smaller than the diameter of said second gear means,

a cylindrical member mounted on said freely rotatable shaft and operatively rotatable with said rotary gear means,

two substantially triangular blade carrier means mounted on said cylindrical member, said triangular blade carrier means having two hook shaped corners,

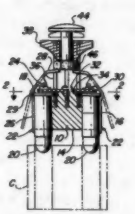
display blade member snap-mounted to said hook shaped corners of said blade carrier means, said display blade member being operative selectively to rotate relative to said cylindrical member to a first position wherein said display member is parallel to said flat surface of said board and to a second position wherein said display blade member is perpendicular to said flat surface of said board, a counterbalance weight mounted on said triangular blade carrier means and located at a third corner therein directly opposite to said display blade member, a pin member mounted on said rotary gear means, and a first abutment means and a second abutment means mounted on said upper portion of said support block member, said pin member operatively abutting said first abutment means when said display blade member is in said first position, and said pin member operatively abutting said second abutment means when said display blade member is in said second position.

4,796,371

CARTRIDGE LOADER FOR REVOLVERS

Gary J. Daniels, 1712 Brinton Manor Dr., Pittsburgh, Pa. 15221

Filed May 13, 1988, Ser. No. 193,603
Int. Cl.[4] F42B *39/04*
U.S. Cl. 42—89 5 Claims



1. A cartridge loader for revolvers, comprising a holder formed symmetrically about a vertical central axis and having

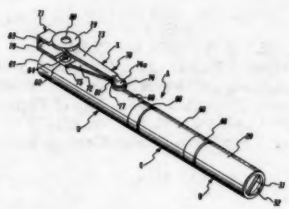
a top, a bottom and a plurality of flutes of substantially semi-cylindrical configuration arranged respectively on axes parallel to the central axis and equally angularly spaced about said axis and opening radially outwardly of the holder as well as at the top and bottom of the holder, each flute being dimensioned to receive a cartridge with a portion of the cartridge rim resting on a portion of the holder top adjacent to the associated flute, a support disposed coaxially with the holder and carried by the holder top, a plurality of fingers equal in number and angular spacing to the flutes and arranged about the support to extend normally downwardly respectively outwardly of and alongside the flutes for respectively engaging flute-carried cartridges, means biasing the fingers inwardly toward the holder for confining the cartridges to the flutes, means mounting the fingers on the support for selective outwardly swinging away from the flutes for releasing the cartridges for downward exit from the flutes, a grip member spaced coaxially above the support and fingers and having central bore, a plurality of upright mounting elements arranged in equal angularly spaced relation about the holder axis and having lower ends extending through the support and into the holder and upper ends extending into the grip member for securing the grip member to the holder, and means for engaging and moving the fingers comprising a plunger axially slidable in the bore of the grip member and having an upper end projecting above the grip member and a lower end engaging the fingers whereby the plunger is normally biased axially upwardly via the fingers and finger-biasing means and is movable manually downwardly relative to the grip member for actuating the fingers.

4,796,372

APPARATUS FOR CONDITIONING ARTIFICIAL FLIES AND LEADERS

Gerald R. Klein, 13451 Stuart Ct. (Rte. 2, Box 713), Broomfield, Colo. 80020

Filed Jun. 30, 1986, Ser. No. 880,191
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 **12 Claims**



1. A conditioner for the preparation of artificial flies and leaders to which artificial flies are attached, which is formed as a cylindrical container having several interconnected, separable segments including:

(a) a first segment containing a fly-treatment fluid, a reduced-diameter stub at one end and an applicator means at the stub adapted to apply a thin coating of fluid onto an artificial fly;

(b) a second segment adapted to be connected to the first segment, having a socket at one end to receive and house the aforesaid stub and applicator means when the segments are connected together, a reduced-diameter second stub at the opposite end of the second segment and a leader-conditioning means at the second stub adapted to straighten and to remove the shine from a leader;

(c) a third segment adapted to be connected to the second segment, having a socket at one end to receive and house the aforesaid second stub and leader-conditioning means;

(d) a holding clip mounted on the side of the third segment to hold the conditioner in a garment pocket when the segments are connected together; and

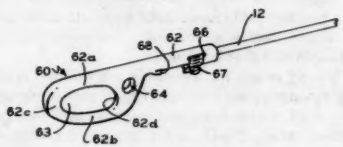
(e) a leader cutting means carried on the holding clip.

4,796,373

FISHING ROD WITH IMPROVED HANDGRIP

Bernard J. Struntz, 1002 Woodbridge St., St. Paul, Minn. 55117

Filed May 11, 1987, Ser. No. 48,747
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 **2 Claims**



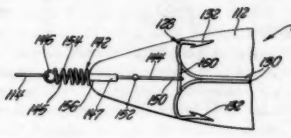
1. A fishing rod having an improved handle for use with a reel, mounted adjacent the handle, said handle being hollow to provide floatation, said handle formed from a pair of mating halves intersecting on a vertically disposed central parting line and fasteners secured between halves of said handle on either side of the parting line to secure said halves together, said handle including a horizontally disposed opening adapted to receive a strip fastener and said strip fastener is adapted to pass through said opening and to engage a portion of a fishing rod reel to secure the reel to said handle, said handle comprising an oblong handle grip having an elongated centrally located hand opening adapted to receive at least three fingers of the user during use, said handle grip formed by an upper and lower elongated forwardly and rearwardly oriented vertically spaced apart integral handle elements one of which is located above the hand opening and one of which is located below the hand opening, said handle element located below the opening forming an enclosure for the fingers of the user's hand, said handle element located above the opening forming a hand grip for the user to grasp in the palm of the hand by extending at least three fingers through said opening, said upper handle element and lower handle element having substantially similar size and shape, said handle elements intersecting and being integral with one another forwardly and rearwardly of the hand opening, said handle including a forwardly extending horizontally disposed rod supporting portion and a finger opening at the forward end of the handle grip portion adjacent the rear end of said forward extension, said finger opening located forward of said hand opening whereby said upper handle element can be held in the palm of the hand with fingers extending through said hand opening and the index finger placed in said finger opening to permit the user to control the action of said rod.

4,796,374

FISHING LURE

Peter F. Tomeo, Jr., 1747 Keats, Madison Heights, Mich. 48071

Filed Sep. 28, 1987, Ser. No. 101,432
Int. Cl.[4] A01K *85/00, 83/00*
U.S. Cl. 43—35 **27 Claims**



1. A fishing lure comprising: body support means for connection to a line;

a first hook means connected to said body support means adapted to be engaged by an object;

a second hook means connected to said body support means for engaging the object and having an open cocked position and a closed position engaging the object;

pivotal means for allowing said second hook means to pivotally rotate relative to said first hook means;

first biasing means for biasing said second hook means toward said first hook means;

trip means connected to the line and engaging said second hook means for supporting said second hook means in said open cocked position and for releasing said second hook means to allow said second hook means to move toward said closed position in response to engagement by the object with said first hook means.

second biasing means for adjustably providing a predetermined amount of force on said trip means to release said second hook means from said open cocked position for movement toward said closed position to engage the object;

said second hook means including a first tubular means forming a first tube connected thereto; and

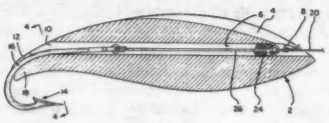
said trip means comprising a rod member having a first end connected to the line and having a second end slidably disposed in said first tubular means to support said second hook means in said open cocked position.

4,796,375

SUB-SURFACE GAME FISHING LURE

Geoff Wilson, 187 Solar Drive, Whittington, 3219 Victoria, Australia

Filed Jul. 1, 1987, Ser. No. 68,621
Claims priority, application Australia, Jul. 7, 1986, 59789/86
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.05 **8 Claims**



1. A lure for sub-surface game fishing, said lure including:

a main body of a shape substantially corresponding to the body shape of a fish, having respective front or nose and rear or tail ends, said main body having a single, unitary channel extending substantially from end to end therethrough,

a hook received and retained in said channel,

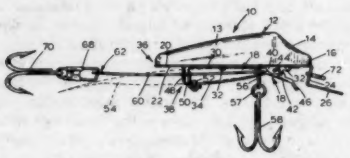
a substantially rigid member, extending within said channel between said nose and tail ends, wherein the front or leading end of said channel is displaced from said nose end of said main body such that the point of tow of said lure is similarly displaced from said nose end, said main body further including a shaped recess towards the front or nose end thereof, said recess forming a concave anterior dorsal surface for said main body, the arrangement being such that said main body is maintained substantially continuously beneath the surface of the water, in a submerged state, during towing or trolling, and wherein said main body includes, at or in the vicinity of the rear or tail end thereof, means for receiving and releasably retaining the hook relative to said main body, the arrangement being such that the hook is attached by the substantially rigid member to a trace or leader and is held substantially fixed relative to said main body until such time as the hook is taken by a fish.

4,796,376

FISHING DEVICE

Gene A. Schlaegel, 1810 Winston Dr., Iowa City, Iowa 52240

Filed Aug. 24, 1987, Ser. No. 90,087
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.29 **12 Claims**



1. A fishing device, comprising:

a plug type artificial fishing lure,

a fish bait harness secured to said lure and adapted to securely hold a fish bait in juxtaposition therewith,

said harness including spring-loaded openable and closable jaws having bait penetrating overlapping prongs for engaging a fish bait,

an elongated bar upon which a fish bait is impaled or skewered carried by said harness,

the prongs on said jaws when in closed position embracing said bar to hold said bar with fish bait against lateral movement relative to said lure, and

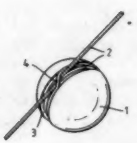
a fish hook depending from said harness.

4,796,377

LINE WEIGHT OR CLEAT

David C. Hosegood, 7 Fulmar Close, Lordswood, Southampton SO1 8E2 Hampshire, and Samuel B. Hosegood, Shipstal Point, Arne, Wareham, Dorset BH20 5BL, both of England

Filed Dec. 10, 1987, Ser. No. 131,376
Claims priority, application United Kingdom, Jan. 23, 1987, 8701499
Int. Cl.[4] A01K *75/06*
U.S. Cl. 43—43.1 **6 Claims**



1. A translucent one-piece essentially spherical body having an essentially equatorial circumferential line guide in the form of a groove essentially V-shaped in cross-section and having a line attached to said body, in which when suspended, said line passes into said V-shaped line guide along a tangent thereto, around said body within said line guide, and out of said line guide along said tangent, said line being attached to the line guide of the body by a clove-hitch knot in said line whereby said line and said body are moveable relative to each other, said body being a weight in water.

4,796,378

SLIP-ON WEED GUARD FOR FISH HOOKS

Clyde A. Krueger, Box 107J, Lonsdale, Minn. 55046; Katharine C. Krueger, Box 107J R#1, Lonsdale, Minn. 55046, and Herman A. Preus, 1101-14th Ave. S.E., Minneapolis, Minn. 55414

Continuation-in-part of Ser. No. 555,437, Nov. 25, 1983, abandoned, which is a continuation of Ser. No. 340,007, Jan. 1, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 571,134

Int. Cl.[4] A01K *83/00*

U.S. Cl. 43—43.2 4 Claims

1. A weed guard for fishhook comprising

a homogeneous tube of molded, resilient, plastic material having a lengthwise bore and a lengthwise slit through the tube wall in communication with said bore, said tube characterized in that when the shank of a fishhook is inserted into the bore the side wall is self-biased to close the slit so that the tube tenaciously grasps the fishhook shank to prevent it from slipping on the shank;

integrally formed arm means extending outward from said tube at one end aligned to at least in part yieldably cover the point of a fishhook at the distal end; and

a member projecting from said tube for entering the eye of a fishhook when said arm means is aligned with the fishhook point.

4,796,379

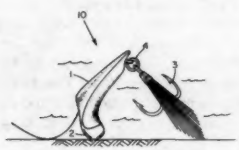
DIVING PLUG FISH LURE

Phillip A. Rabideau, 3605 Fawn Creek Path, Austin, Tex. 78746

Continuation-in-part of Ser. No. 884,723, Jul. 11, 1986, abandoned. This application Jul. 24, 1987, Ser. No. 80,223

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.48 6 Claims



1. A diving plug fishing lure comprising:

A. a buoyant main body means;

B. a compound curved frontal section means, and integral weighted lip means, of said main body means, so that said lure descends stably, unaided, vertically, without line tension and so that the force of water reacting with said compound curved frontal section means causes said lure to wobble in a longitudinal, horizontal plane while descending vertically; and

C. hook means attached to said main body means.

4,796,380

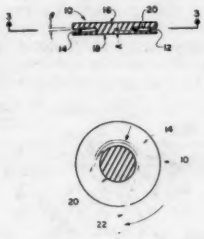
FISHHOOK HOLDER

Howard Beese, 111 Maroy Dr., South Amherst, Ohio 44001

Filed Jun. 8, 1987, Ser. No. 59,626

Int. Cl.[4] A01K *97/06*

U.S. Cl. 43—57.1 1 Claim



1. A fishhook holding device comprising a member having first and second exterior wall surfaces, and first and second opposing interior wall surfaces, wherein said first interior wall surface is angularly disposed with respect to said first exterior wall surface such that an angle α is thereby defined, wherein said second interior wall surface is angularly disposed with respect to said second exterior wall surface such that an angle β is thereby defined, wherein said angles α and β not necessarily being equal to each other, said first and second interior wall surfaces further defining a circumferential channel, said channel having its radial axis not parallel to said first and exterior wall surfaces, said member further having a central axis upon which said first and second interior wall surfaces converge, such that said circumferential channel narrows at the point of convergence, said first and second interior wall surfaces providing a yieldable surface area for retaining a fishhook when said fishhook is fixedly located near the point of convergence, said yieldable surface effectively eliminating the need for any outside biasing force.

4,796,381

INSECTICIDAL COMPOSITIONS

Hans-Herbert Kauth, Ingelheim am Rhein, and Hanshelmut Itzel, Gau-Algesheim, both of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 901,019, Aug. 28, 1986, abandoned. This application May 27, 1987, Ser. No. 54,437

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531795

Int. Cl.[4] A01M *1/20*

U.S. Cl. 43—124 9 Claims

1. An insecticidal composition consisting essentially of a sheet of carrier material divisible into segments thereof by cutting, discrete deposits of at least one insecticidal substance printed onto a surface of said sheet of carrier material, and surface areas devoid of deposits of insecticidal substance spatially separating said discrete insecticidal deposits from each other, whereby waste material produced by cutting individual insecticidal segments from said sheet is devoid of insecticidal substance.

4,796,382

CHRISTMAS TREE HOLDER

William E. Anderson, 4211 174th SE., Bothell, Wash. 98036

Filed Feb. 28, 1983, Ser. No. 470,389

Int. Cl.[4] A47G *7/02*

U.S. Cl. 47—40.5 2 Claims

1. A tree holder comprising:

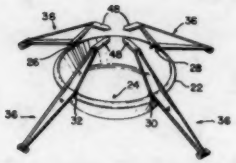
a. a container having a bottom and an outer rim, the diameter

of said container being greater than the depth of said container;

b. impaling means disposed in the bottom of said container for engaging a tree placed in said container;

c. at least three brackets attached to the outer rim of said container, said brackets spaced an equal distance apart on the rim, each bracket adapted to receive a pin;

d. at least three legs with each leg comprised of three support members of unequal length in triangular shape with the apex of the longest and middle size support members resting on the ground, and a holding member extending from the apex of the shortest and longest support member, the distance between the ends of opposing holding members initially being greater than the diameter of the tree trunk to be placed therethrough, said legs supporting said container above the floor by being pinned to said brackets at the apex of the shortest and middle size support members by pins so as to allow rotation of said legs about a longitudinal axis running through the pins whereby the weight of a tree placed through said holding members and into the container engaging said impaling means depresses the container and causes the holding members to contact and support the tree; and



e. spring means wound around each pin and abutting against the inside of said container and the shortest support member to maintain the container in a position above ground level prior to insertion of a tree therein.

4,796,383

COLLAPSIBLE REUSABLE PLANTER BOX

Bert Inoue, Simi Valley, and Phil Lee, Moorpark, both of Calif., assignors to Dura Lee, Ltd., Moorpark, Calif.

Filed May 29, 1986, Ser. No. 868,263

Int. Cl.[4] A01G *9/02;* **47** *66, 73, 77, 76;* **217** *65;* **220** *4 F, 77;* **403** *253, 254, 231*

U.S. Cl. 47—73 **12 Claims**

1. A side panel capable of being connected to the other side panels to form a planter box comprising:

a. an inner surface and an outer surface, a top and a bottom edge and first and second side edges;

b. inserting means on the first side edge and receving means adjacent to the second side edge, the inserting means of one side panel capable of being connected with the corresponding receiving means of an adjacent side panel;

c. securing means on the side panel located adjacent to the receiving means for securing the connection between the inserting means and the receiving means; and

d. the side panel is in a plane, and wherein the first and second side edges contain rims that run along the first and second side edges and are perpendicular to the plane of the side panel wherein the securing means is adapted to engage one edge of the rim of the first side edge.

4,796,384

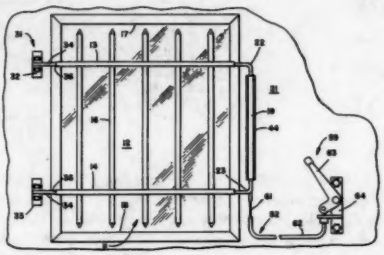
ADAPTABLE SECURITY GRILLE AND LATCHING MECHANISM

David R. Warwick, 51 Silverwood Dr., Lafayette, Calif. 94549

Filed Dec. 21, 1987, Ser. No. 136,704

Int. Cl.[4] E06B *3/68*

U.S. Cl. 49—55 **6 Claims**



1. In a security grille for disposition at a window, door, or the like, the combination comprising:

at least first and second cross bars which extend in a horizontal direction and which are vertically spaced apart with said first bar being above said second bar, each of said first and second bars having a first end portion adjacent a first side region of said grille, at least said first end portions of aid firsts and second bars having a hollow tubular configuration defining internal passages in said cross bars,

a vertically extending side member situated at said first side region of said grille, said side member having a hollow tubular configuration at least at an upper portion thereof and a lower portion thereof,

means for fastening said side member to a wall or the like, comprising a releasable latch secured to said side wall or the like at a location which is behind said side member; said side member including a latch cover which extends between said side member and said wall or the like at each side of said latch when said side member is engaged by said latch; and

first and second angle members each having a horizontally extending leg and a vertically extending leg, said horizontal legs of said first and second angle members being entered into said first end portions of said first and second cross bars respectively in telescoping relationship therewith, and said vertical legs of said first and second angle members being entered into said upper and lower portions of said side connector member in telescoping relationship therewith.

4,796,385

GATE LOCKING DEVICE

Michael E. Tyler, One Medical Park Pla., 14615 San Pedro, San Antonio, Tex. 78232

Filed Aug. 5, 1987, Ser. No. 83,314

Int. Cl.[4] E05D *7/00*

U.S. Cl. 49—280 **9 Claims**

1. A locking apparatus for a swinging gate having a swing arm powered gate opener, said locking apparatus comprising:

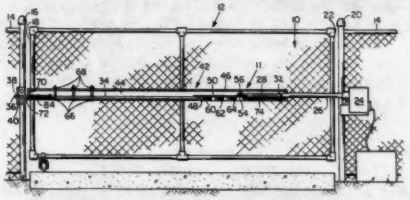
a locking bolt slidably supported on said swinging gate so said locking bolt may move between an extended position

for engaging bolt receiving means and a retracted position;

said swing arm powered gate opener for extending to produce a first force sufficient to move said gate from an open position to a closed position and to move said locking bolt to said extended position, and for retracting to produce a second force sufficient to move said gate from said closed position to said open position and to move said locking bolt to said retracted position;

said swing arm being attached to said gate through said locking bolt so said first force is in the direction of extending said locking bolt and so said second force is in the direction of retracting said locking bolt;

resisting means engaging said locking bolt for preventing said locking bolt from extending into said extended position until said gate reaches said closed position and for retracting said locking bolt before said second force moves said gate toward said open position, said resisting means positioned to exert a third force on said locking bolt directed against extension of said locking bolt, said first



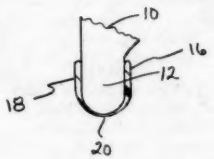
force on said locking bolt being substantially dissipated through movement of said gate until said gate reaches said closed position so said locking bolt remains retracted during said movement, and said first force overcomes said third force and extends said locking bolt when said first force is no longer dissipated through said movement, said resisting means comprising a first and a second spring, said first spring having a first resistance to stretching, said second spring having a second resistance to compression, the sum of said first and said second resistance being greater than a third resistance to moving said gate toward said closed position, said first spring being attached to said locking bolt and to said gate so said spring must be stretched for said locking bolt to extend toward said extended position, said second spring engaging said locking bolt and said gate so said second spring must be compressed for said locking bolt to extend toward said extended position, said first and said second resistance providing said third force.

4,796,386

NON-METALLIC EDGE GUARD ATTACHMENT TO A DOOR

Robert Adell, Sunnyvale, Tex., assignor to U. S. Product Development Company, Sunnyvale, Tex.

Filed Jun. 25, 1987, Ser. No. 66,858
Int. Cl.[4] B60J *5/00*
U.S. Cl. 49—462 **17 Claims**



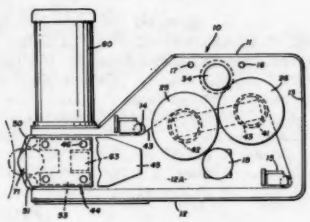
1. In combination with the trailing edge of a swinging door, a plastic door edge guard comprising a shaped cross section having inner and outer legs which extend from a base and fitting onto the trailing edge of the swinging door, said base comprising a character which enables the edge guard to be spread more or less apart so as to be open for fitting onto the trailing edge of the swinging door and assuming an installed condition wherein the sides of the legs are disposed against opposite sides of said trailing edge, said plastic door edge guard comprising an improved means for installing and attaching the edge guard to the trailing edge which comprises an adhesive material lining the interior of the edge guard from the base substantially to the distal ends of the legs, and a release layer covering said adhesive material prior to installation so that the adhesive material is not exposed, said release layer comprising separately releasable sections which are sequentially stripped from the edge guard during the installation process, one of said sections covering one leg and being the first stripped away to expose the adhesive material of that one leg while another section remains covering the other leg, the edge guard being somewhat spread open during installation such that the leg on which the adhesive material has been exposed can be adhered to one side of the door edge and then the other section of release layer stripped away to expose the adhesive material on the other leg, and the spread of the edge guard is then reduced by wrapping the base around and against the end of the trailing edge and by adhering the other leg to the other side of the trailing edge, said base having a reduced thickness from the thicknesses of said legs to facilitate conformance of the base to wrapping around the end of the trailing edge.

4,796,387

MICRO-ABRASIVE FINISHING DEVICE

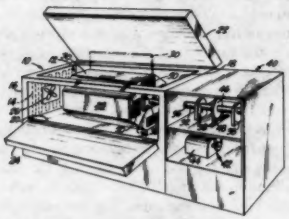
James N. Johnson, P.O. Box 2747, Youngstown, Ohio 44507

Filed Nov. 19, 1987, Ser. No. 122,755
Int. Cl.[4] B24B *7/00, 21/00*
U.S. Cl. 51—62 **6 Claims**



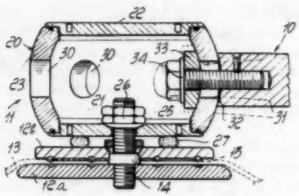
1. A micro-abrasive finishing device used to finish work pieces of different configuration comprises in combination, a housing having multiple sides a bottom and a top, a removable interchangeable abrasive cassette mounted within said housing, said abrasive cassette comprises a pair of abrasive spool assemblies, an abrasive spool with an abrasive band of micro-abrasive material positioned on at least one of said abrasive spool assemblies, an oscillating head assembly within said housing, a plurality of guide rollers within said housing aligned to guide said abrasive band into said oscillating head assembly, said oscillating head assembly comprises in combination an independent fixed mounting plate, a plurality of spaced, fixed rods extending between said fixed mounting plate and said housing, a nylon head insert movably positioned on said rods, means for oscillating said head insert, means for selectively driving one of said abrasive spool assemblies, a yoke adjustably positioned in said nylon insert, a platen positioned in said yoke, means for adjustably positioning said yoke in said nylon head insert, means for restrictive, selective, directional rotation of said abrasive spool on said abrasive spool assemblies, means for adjustably maintaining tension on said abrasive band.

4,796,388
DEFLASHING APPARATUS
Al Steckis, 19 N. Ridge Dr., Coram, N.Y. 11727
Filed Jul. 9, 1987, Ser. No. 71,365
Int. Cl.[4] B24B *31/02*
U.S. Cl. 51—164.1 **22 Claims**



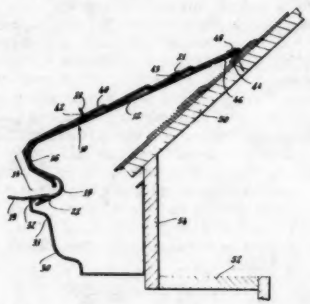
1. An apparatus for deflashing of elastomeric elements comprising:
(a) a tumbling barrel having a closable opening for introducing and withdrawal of elastomieric elements and deflashing media to the interior of the barrel;
(b) a refrigeration chamber sized for receiving the barrel therein, having an access opening for providing access to a barrel located therein, having means for mounting the barrel therein, means for lowering the temperature of the interior of the chamber and having additional cool air circulation means within the interior of the chamber;
(c) means for imparting motion to the barrel mounted within the chamber to achieve impacting movement to the barrel contents and
(d) said barrel having aperture means providing access of the cooled atmosphere within the refrigeration chamber into the interior of the tumbling barrel.

4,796,389
RETICULAR SPATIAL STRUCTURE
Dante Bini, San Francisco, Calif.; Domenico Bogliari, Olmo, Italy; Sandro Lomoro, Rome, Italy; Daniele Minozzi, Padua, Italy; Stefano Pietrogrande, Rome, Italy, and Dario Zucchi, Bologna, Italy, assignors to Binistar International N.V., Curacao, Netherlands Antilles
Filed Jun. 1, 1987, Ser. No. 55,955
Claims priority, application Italy, Jun. 5, 1986, 20687 A/86
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—2 **15 Claims**



1. Reticular spatial structure comprising; perimetral nodes,
a plurality of perimetral rod-like elements having ends, said ends being associated with said perimetral nodes,
connecting nodes defining a geometrical center and each comprising a lower plate, an upper plate, and a hollow body having an inner surface and an outer surface,
a plurality of variable-length rod-like elements having ends and axes, said ends being hingeable to said connecting nodes to form a framework, at least part of said variablelength rod-like elements being rotatable both about said axes and with respect to said geometrical center of said connecting nodes for causing extension of said variablelength elements to a final selected extension length during raising of said framework to form a reticular spatial structure having a dome-like shape, said structure further comprising;
node rod fixing bolts adapted for fixing said rod-like elements to said nodes
locking means adapted to prevent return of said rod-like elements to a length which is different from said final selected extension length,
a rocker suspension pivot connected to each said hollow body, and
a covering membrane held by said lower plate and said upper plate of each of said connecting nodes and coupled to said rocker suspension pivot, wherein said inner surface and said outer surface of said hollow body are shaped as equatorial segments of concentric spheres, and wherein said hollow body has a wall inscribed by said two concentric spheres and provided with a plurality of openings, said openings being arranged radially for allowing insertion of said node-rod fixing bolts and for achieving structural continuity of said structure after pneumatic raising thereof.

4,796,390
RAIN GUTTER DEVICES
Robert J. Demartini, 3500 Canter La., Raleigh, N.C. 27604
Filed Nov. 12, 1987, Ser. No. 119,683
Int. Cl.[4] E04D *13/04*
U.S. Cl. 52—12 **8 Claims**



1. A device for securing rain water gutter deflector apparatus to an associated building structure comprising
an elongated continuous strip having a substantially straight upper portion and a double reverse-curved lower portion,
said straight portion having upper attachment means integral therewith for affixing to said device a gutter deflector positioned at the top of said straight section and the uppermost curve of said double-reverse curved lower portion,
the lowermost curve of said double-reversed portion including lower attachment means for affixing said device to an associated rain gutter in supported relationship thereto.

4,796,391
OVERHANG STRUCTURE
Chao-Hsiung Lu, Kaohsiung Hsien, China, assignor to Formosa Shinn Yuan Industrial Co., Ltd., Taiwan
Filed Nov. 24, 1987, Ser. No. 124,570
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—73 **2 Claims**

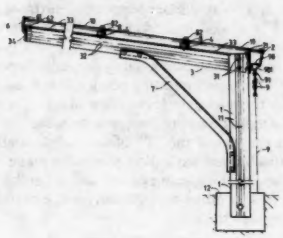
1. An improved structure comprising,
posts of an aluminium alloy having a hollow rectangular

cross-sectional form with two wide sides and a top end, provided with a notch in the top end and with at least two lengthwise recessed or protruded reinforcing ribs at the two wide sides and holes bored between said two reinforcing ribs for assembling with rafters with bolts,

rafters of an aluminum alloy with two wide sides, an upper side, and a front and rear end, to be combined with the posts at the rafters' rear ends, having a hollow rectangular cross-sectional form, provided with at least two reinforcing ribs recessed or protruded at the two wide sides, two discontinuous parallel ridges having the same length on the upper side for placing auxiliary poles to increase the strength of the rafters,

struts of an aluminium alloy with two ends, an upper part, and a lower part, to be combined with posts at one end and with rafters at the other end for supporting the rafters, having the cross-sectional form that the upper part is provided with two side walls having the same height, the distance between the two side walls being equal to the width of the rafter and the post for attachment, and the lower part is a hollow rectangle with several vertical reinforcing ribs,

auxiliary poles of an aluminium alloy having two ends, to be placed crosswide on the rafters between the parallel ridges for supporting roof sheathing, having a U-shaped cross-sectional form with upper corners and a lower edge with a hook set at one upper corner for an assembly nail to be hooked, roof sheathing, having side edges, a front edge, and a rear edge, attached to the rafters,



assembly nails provided with an elastic resin nail base having a vertical ridge for catching and a metal bended nail extending down from said base,

a right and a left symmetrical fascia of an aluminium alloy, having an E shape, provided with an upper flat horizontal wall for pressing the side edge of the roof sheathing, a middle flat horizontal wall wider than the upper wall for being set at the lower edge of the end of the auxiliary poles,

a front beam of an aluminium alloy with a rear upper and lower part, provided with two parallel horizontal walls forming an opening at the rear upper part for placing in the opening the front edge of the roof sheathing and a horizontal wall at the rear lower part for combining with the upper side of the front end of the rafter with screws,

a rear beam of an aluminium alloy, having a near U shape for its cross-section with a front upper edge, a rear wall having a top, and two ends, provided with a hook at the front upper edge for hooking in the top end notch of the post, at least two reinforcing ribs recessed or protruded at the rear wall, a L-shaped pressing wall at the top of the rear wall for pressing the rear edge of the roof sheathing, water outlets at both ends and a bucket placed under each outlet and connected with a drain chain hanging down to the ground and,

drain chains constituted with a chain head with several adjusting wings and a series of chain rings connected with one another, each ring provided with at least one connecting notch with an inclined tip end for connecting with the counterpart of another chain ring.

4,796,392

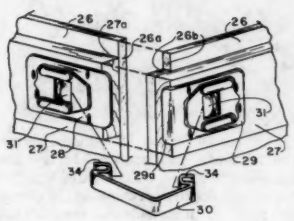
SYSTEM FOR INTERCONNECTING PANELS OF CONTAINERS

Andrew S. Graham, Jr., 2802 Jefferson Ct., Ambler, Pa. 19002

Continuation-in-part of Ser. No. 841,477, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 710,492, Mar. 11, 1985, Pat. No. 4,584,806. This application Nov. 4, 1987, Ser. No. 117,215

Int. Cl.[4] B65D *19/16, 9/12*

U.S. Cl. 52—79.5 **15 Claims**



1. A container having walls defining an interior container volume of rectangular shape, the walls including four upright side walls meeting at upright corners of the container, the walls being formed of panels extended horizontally between the upright corners, an end portion of a first panel at one side of a corner being positioned and extended to overlap the end surface of a second panel at the other side of that corner, a spring clip fastening device for interconnecting panels adjacent an upright corner, said device including apertured plates mounted on the outer sides of the panels adjacent the ends thereof and a spring clip having end portions positioned to engage the apertures of said plates, and the plate mounted on said second panel having an end abutment portion projecting beyond the end of the second panel in a position overlying the end of the first panel, the panels adjacent each of the upright corners of the container being relatively positioned with respect to each other in accordance with the above definition and being interconnected by a spring clip fastening device in accordance with the above definition, with the ends of the panels overlapping each other at each corner in a first series extended around the upright corners of the container in one direction and further with the abutment portions of the plates of the fastening devices at each corner projecting in a second series extended around the upright corners of the container in a direction opposite to said first series.

4,796,393

DECORATIVE AWNING AND FACIA STRUCTURES AND METHODS AND APPARATUS FOR FORMING THE SAME

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

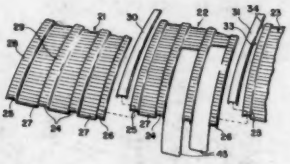
Filed Aug. 9, 1985, Ser. No. 764,296

Int. Cl.[4] E04D *3/30*

U.S. Cl. 52—76 **14 Claims**

1. In a metal awning assembly, a main awning body section comprising a plurality of individual metal panel sections each having a prearranged curvature and being joined in side-to-side relation, each of said individual panel sections comprising a sheet of thin gauge metal formed with a plurality of individual longitudinal reinforcing rib sections mutually spaced from each other between panel regions, each of said rib sections having an inverted generally U-shaped cross section having a generally flat face and which includes a deep hook portion where joined to the intervening panel region; each of said

panel sections including male and female rib sections formed on opposite edges of said panel with each of said male and female rib sections comprising an inner deep hook portion curving laterally and away from the body of said panel section, an outer deep hook portion curving laterally and toward the body of said panel section, and a generally flat section intermediate said inner and outer hook sections, said outer hook portion on said female rib section having a longer hook portion, and said male rib section being received into said female rib section in snap together relation to hold said panel sections



together; said assembly further including a plurality of elongated thin metal sheets each received in said hook portions between adjacent rib sections on said panel regions and having a width prearranged slightly greater than the distance between said indented hook portions such that opposite edges of each said elongated sheet are received in said indented hook portions to retain each said elongated sheet in position on said panel regions, whereby the basic decorative color appearance of said panel sections is determined largely by the color of said elongated thin metal sheets inserted therein.

4,796,394

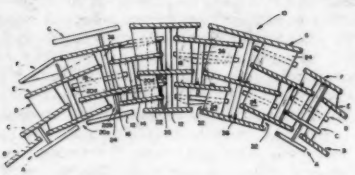
GEODESIC STRUCTURE

Lemuel J. Chastain, 8201 Fourth Ave., Brooklyn, N.Y. 11209

Filed Nov. 13, 1987, Ser. No. 119,969

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—81 **16 Claims**



1. A geodesic structure comprising at least three concentric surface layers, said layers being defined by planar panel members, said panel members of each layer approximating a polyhedral surface, each of the surface layers being related through geometric transformation further including support means for interconnecting the panel members of a first surface layer with the panel members of an adjacent surface layer and with the panel members of a non-adjacent surface layer.

4,796,395

SOLARIUM WITH MUNTINLESS EXTERIOR

Benjamin Israel, Huntingdon Valley, Pa., assignor to Jardin, Inc., Southampton, Pa.

Filed Jan. 8, 1987, Ser. No. 1,591

Int. Cl.[4] E04B *7/18, 7/02*

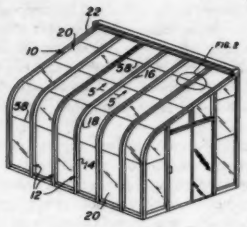
U.S. Cl. 52—86 **13 Claims**

1. A solarium structure, comprising:

a framework for supporting and retaining a plurality of glazing panels, said glazing panels being comprised of at least two sheet panels of glass having a peripheral non-glass spacer therebetween to form an insulating space between the two panels of glass, at least one sheet panel comprising an outer sheet panel and at least one sheet panel comprising an inner sheet panel;

said framework including a plurality of mullions having substantially vertical portions, sloping portions and curved portions connecting said vertical portions with said sloping portions, said mullions having an inner supporting member and an outer retaining member;

said framework including a plurality of substantially horizontal inner muntins connected to said mullions, said muntins being comprised of a supporting member having a "T" cross-sectional shape with the leg of the "T" projecting outwardly, and the top of the "T" forming a pair of inner supporting surfaces for said glazing panels;



said glazing panels being supported between said inner supporting members and said outer retaining members of said mullions and on said inner supporting surfaces of the tops of the "T"s of said muntins and between the legs of said "T" shaped muntins;

said outer sheet of adjacent glazing panels juxtaposed the leg of said "T" shaped muntins being aligned and not overlapped to form an exterior surface in a single plane; and

caulking material covering the space between glazing panels and over the legs of the "T" of said substantially horizontal muntins but not extending above the plane of the exterior surface of the glazing panels and whereby there is an absence of a conductive path between exterior and interior along said muntin.

4,796,396

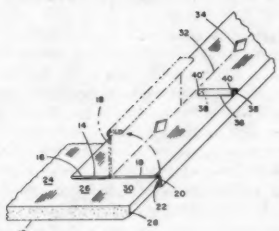
INTEGRAL WALLBOARD AND STUD

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Aug. 10, 1987, Ser. No. 83,488

Int. Cl.[4] E04B *2/30*

U.S. Cl. 52—127.5 **7 Claims**



1. A wallboard and stud unit comprising a wallboard and an elongate sheet metal strip affixed to the back face of said wallboard, said metal strip having an elongate attachment portion affixed to said wallboard, said metal strip also having an elongate web portion which is formed and suitably disposed for bending, along an elongate fold line parallel to an edge of said wallboard, from a storage form, in which said attachment

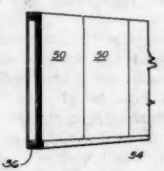
portion and said web portion are substantially coplanar, to a functional form, in which said web portion extends substantially perpendicularly to said wallboard back face and to said attachment portion, wherein said metal strip further includes a flange portion extending perpendicularly from the outer edge of said web portion and wherein said flange portion is disposed along and closely spaced from the side edge of said wallboard, when said web portion is in a storage form, and said flange portion is substantially equal in width to the thickness of said wallboard.

4,796,397

DEMOUNTABLE PANEL STRUCTURE

Raymond W. Capaul, Route #3, Wildwood Drive, Aurora, Ill. 60504

Filed Sep. 21, 1987, Ser. No. 98,794
Int. Cl.[4] E04B *1/82*
U.S. Cl. 52—144 **9 Claims**



1. A demountable acoustical ceiling and wall panel structure, consisting essentially of: a lightweight core member in the form of a honeycomb having wall portions defining a plurality of open-ended cells and opposed cell end planes; a single-ply, thin, dense, sound transmitting, substantially homogeneous, glass fiber sheet of substantially uniform thickness secured to each of the opposed major surfaces of the core member in substantially parallel relation to each other and to said cell end planes; separable fastening means secured in preselected spaced relation on the exposed surface of one of said single-ply glass fiber sheets to enable the panel structure to be demountably secured on a supporting surface provided with cooperating separable fastening means with only hand pressure; and decorative coating on the exposed surface of the other of said single-ply glass fiber sheets, said panel structure having a flame spread of less than 25.

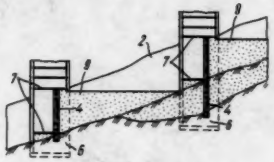
4,796,398

FOUNDATION OF A BUILDING OR INSTALLATION ERECTED ACROSS A RAVINE EXTENDING ALONG A SLOPE

Viktor A. Golovko; Semen P. Valts, both of Yalta; Alexandr M. Lekhno, Simferopol; Alexandr N. Tetior, Simferopol, and Boris J. Barykin, Simferopol, all of U.S.S.R., assignors to Simferopolsky Filial Dnepropetrovskogo Inzhenerno-Stroitelnogo Instituta, Simferopol, U.S.S.R.

PCT No. PCT/SU86/00091, § 371 Date May 29, 1987, § 102(e) Date May 29, 1987, PCT Pub. No. WO87/02083, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 26, 1986, Ser. No. 82,862
Int. Cl.[4] E02D *19/00*
U.S. Cl. 52—169.2 **1 Claim**

1. A foundation of a building or installation erected across a ravine extending along a slope and having face ends bearing against opposite slopes of the ravine, said foundation comprising a vertically extending longitudinal wall and vertically extending transverse walls connected to said longitudinal wall, said longitudinal wall being arcuate with a camber facing towards a higher ravine point, characterized in that said transverse walls are substantially parallel with each other and are inscribed in an imaginary rectangle in the plan view.

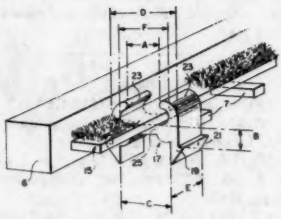


4,796,399

COMBINATION WALK-OFF AND FATIGUE MAT

Ronald N. Kessler, Youngstown; Myron Ullman, Canfield, and Milton Kessler, Youngstown, all of Ohio, assignors to Boardman Molded Products, Inc., Youngstown, Ohio

Filed Oct. 20, 1987, Ser. No. 110,313
Int. Cl.[4] E04F *19/10*; A47L *23/22*
U.S. Cl. 52—177 **10 Claims**



1. A combination walk-off and fatigue mat comprising
a first series of parallel flexible top ribs spaced apart a distance approximately equal to their own width,
a second series of parallel flexible bottom ribs underlying and crossing said top ribs and spaced apart at least twice the distance separating the top ribs, the ribs of the two series being integrally molded together at all points where they cross, and
a third series of parallel ribs extending parallel to said second series of parallel bottom ribs and located therebetween, said third series of ribs overlying said second series of parallel flexible bottom ribs and projecting upwardly therefrom to a height less than the height of said first series of parallel flexible top ribs.

4,796,400

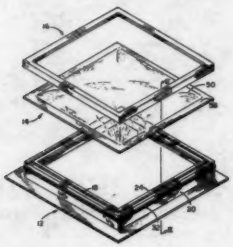
SKYLIGHT WITH IMPROVED SEAL

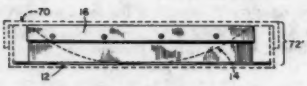
Lawrence Mulder, Holland, Mich., assignor to ODL, Incorporated, Zeeland, Mich.

Filed Aug. 24, 1987, Ser. No. 88,563
Int. Cl.[4] E04B *7/18*
U.S. Cl. 52—200 **7 Claims**

4. A skylight kit comprising:
a curb assembly for supporting a dome on a roof, said curb assembly including an upwardly facing support portion defining a plane;
a gasket adhered to said support portion; and
a dome including an arched panel and a peripheral portion extending thereabout and defining a plane, said peripheral portion engaging at least one of said support portion and said gasket, said arched panel extending downwardly

from said support portion and into the interior of said curb assembly, whereby said kit presents a low profile for storage and transportation, and further whereby said





dome can be removed from said curb assembly, inverted, and reseated on said curb assembly and gasket upon installation in a roof.

4,796,401

COMPOSITE FIRE STOP DEVICE

Jonathan B. Wexler, Victoria, Australia, assignor to Fire Research Pty., Limited, Victoria, Australia

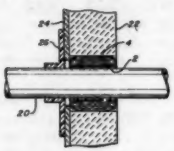
PCT No. PCT/AU86/00213, § 371 Date Apr. 3, 1987, § 102(e) Date Apr. 3, 1987, PCT Pub. No. WO87/00761, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 28, 1986, Ser. No. 51,629

Claims priority, application Australia, Aug. 6, 1985, 45811/85

Int. Cl.[4] A62C *3/00, 3/04*

U.S. Cl. 52—232 **12 Claims**



1. A fire stop composite assembly which is positionable on a plastic pipe as a composite, said assembly comprising:

a rigid sleeve of heat-softenable material adapted to be fit over a plastic pipe;

an annular collar of intumescent material surrounding an external surface of the sleeve, said collar having an axial end face located inwardly of one axial end of the sleeve;

said sleeve defining an annular flange between said axial end face of the collar and said one end of the sleeve;

an annular layer of flexible refractory material around said annular flange;

force-applying means applied around the refractory layer to apply a radially compressive force to the flange, wherein upon softening of the annular flange and pipe in the event of a fire said force-applying means acts to constrict the flange and the pipe which may subsequently burn to form a carbon mass within the annular layer of refractory material, and

wherein said assembly is positionable as a composite on the pipe by slidably engaging the sleeve on the pipe.

4,796,402

STEP SILENCING PARQUET FLOOR

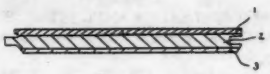
Jari Pajala, Riihimaki, Finland, assignor to Paloheimo Oy, Riihimaki, Finland

Filed Mar. 30, 1987, Ser. No. 31,568

Claims priority, application Finland, Apr. 1, 1986, 861396

Int. Cl.[4] E04F *13/08*

U.S. Cl. 52—390 **6 Claims**



1. A laminated flooring board for a parquet flooring comprising a wear resistant surface layer on top of the board and a parallel supporting construction layer bonded to the bottom side of said surface layer, said board having longitudinal sides and ends formed with a tongue and groove whereby said board will cooperate with adjacent boards to form a self-silencing parquet floor, said flooring board being characterized in that said supporting construction layer consists of a non-homogeneous fiber board wherein said non-homogeneity is provided by surface compactness of the fiber board.

4,796,403

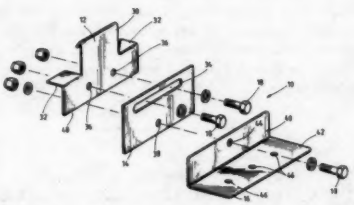
ARTICULATING ROOFING PANEL CLIP

David A. Fulton, Humble, and Jerry D. Boen, Houston, both of Tex., assignors to Metal Building Components Incorporated, Houston, Tex.

Filed Aug. 28, 1987, Ser. No. 90,705

Int. Cl.[4] E04D *1/34*

U.S. Cl. 52—713 **14 Claims**



11. A clip for assembly of two roofing panels, interconnected by a standing seam, on a purlin, comprising:

a bracket, attachable to a purlin, and configured to fit within and engage said standing seam;

said bracket including a separate central component, an upper component and a lower component,

said central component disposed inbetween, and interconnecting, said upper component and said lower component, said central component being pivotally connected to said lower component to provide for relative rotational movement between said lower component and said upper component;

said lower component being attachable to said purlin and said upper component configured to fit within and engage said standing seam.

4,796,404

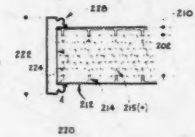
LIGHT-TRANSMITTING THERMAL BARRIER

Robert B. Butler, 20 Tibet Dr., Carmel, N.Y. 10512

Continuation-in-part of Ser. No. 783,630, Oct. 3, 1985, abandoned, which is a continuation of Ser. No. 586,636, Apr. 10, 1984, which is a division of Ser. No. 449,682, Dec. 14, 1982, Pat. No. 4,443,978. This application Jan. 9, 1987, Ser. No. 4,858

Int. Cl.[4] E04C *2/54*

U.S. Cl. 52—789 **21 Claims**



18. A light-transmitting thermal barrier comprising:

(a) a translucent body of thermally-insulating material,

(b) a first light-transmitting panel on one side of said translucent body of thermally-insulating material having an inner side,

(c) a second light-transmitting panel on the other side of said translucent body of thermally-insulating material having an inner side,

(d) each of said first and second light-transmitting panels being substantially coextensive in area to the area of said translucent body of thermally-insulating material,

(e) said first light-transmitting panel having a first plurality of inner ribs orthogonally extending from said inner side of and along said light-transmitting panel and in contact with one side of said translucent body of thermally-insulating material,

(f) said second light-transmitting panel having a second plurality of inner ribs orthogonally extending from said inner side of and along said light-transmitting panel and in contact with the other side of said translucent body of thermally-insulating material.

4,796,405

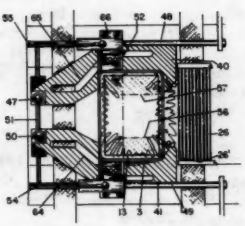
FILM FOLDING DEVICE

Dave L. Owen, Wellford, and Robert E. Jahn, Greer, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Sep. 25, 1987, Ser. No. 101,234

Int. Cl.[4] B65B *11/18*

U.S. Cl. 53—222 **2 Claims**



1. In an apparatus for wrapping a generally rectangular tray filled with a product in a sheet of thermoplastic film or the like, a film folding device for folding film under the tray comprising:

(a) means for holding a sheet of film horizontally above the tray;

(b) means for lifting the tray into the film while the film is so held, the film being draped and held around the tray when the tray is lifted to its highest position;

(c) a back folding bar mounted parallel to the back edge of the tray for reciprocal, linear motion towards and under the tray to fold the film against the back underside of the tray; said back folding bar being above the film while the film is so held;

(d) a pair of folding arms mounted to move linearly towards and under the tray but above the film simultaneously with the back folding bar to fold the film against the underside of each the side of the tray; said folding arms further comprising:

(1) a straight edge of the side of each folding arm adjacent the tray, said straight edge being parallel to the adjacent tray edge and said straight edge extending in length for a substantial portion of the length of the adjacent tray edge; said straight edges being disposed to contact the draped film immediately before contact of the film by the back folding bar;

(2) a cam slot in each folding arm, said slots defining a cam surface sloped relative to the direction of movement of said arms for a portion of the length of the slots, so that cam followers moving linearly in each slot will drive the arms towards each other at right angles to the direction of motion of the cams followers;

(3) a cam follower mounted in each slot for travel therein, each cam follower being fixed to said back folding bar whereby when said bar is advanced towards the tray, the folding arms move simultaneously towards the tray; and,

(4) a gathering edge, said gathering edge extending from the straight edge in the direction towards the rear of the tray and sloping away from the tray, the slope of said gathering edge and said portion of the cam slot being chosen so that the back folding bar and gathering edge coincide at a point which is approximately below the adjacent back corner of the tray;

(e) a horizontally stationary front folding bar mounted parallel to the front edge of the tray and above the film; and,

(f) means for moving the tray forward from the lifting means after the film has been released from the holding means, the side arms have folded the film under the sides, and the back bar has folded the film under the back of the tray whereby when said tray is moved forward the front folding bar folds the film under the front underside of the tray to complete the wrapping of the tray.

4,796,406

CUP-FILLING APPARATUS FOR A NUTRIENT AND PALATABLE MATERIAL, ESPECIALLY A DAIRY PRODUCT

Burkhard Gies, Wuppertal, and Berthold Lingenhoff, Hilden, both of Fed. Rep. of Germany, assignors to Hamba-Maschinenfabrik Hans A. Muller GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 58,164

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619519

Int. Cl.[4] B65B *43/40, 43/42*

U.S. Cl. 53—202 **10 Claims**

4. In a cup-filling apparatus for packaging a comestible product, comprising:

transport means for carrying a plurality of rows of cups moving on separate tracks along a transport path,

means at a first station for positioning said cups on said transport means,

means for filling said cups with said comestible product, and

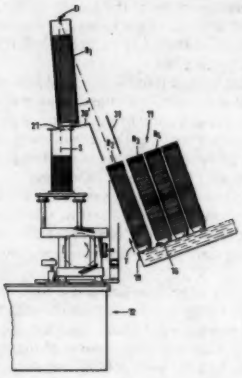
means at another station along said transport path for applying covers to said cups, the improvement which comprises:

feeder magazine means at one of said stations formed with a number of upright feed magazines equal in number to the number of cups of each row, each of said feed maga-

zines being assigned to a respective one of said tracks and receiving a stack of elements selectively constituted of said cups and said covers and provided with means for feeding individual elements from bottoms of said stacks to said transport means;

an intermediate magazine having a number of upright magazine shafts equal in number to said tracks and simultaneously shiftable into alignment with respective feed magazines of said feeder magazine means for delivering respective stacks of said elements from said shafts to said feed magazines;

elevator means below said intermediate magazine and having a number of elevator shafts equal in number to



said tracks and alignable from below with respective ones of said magazine shafts of said intermediate magazine in a position of said magazine shafts out of alignment with said feed magazines and prior to shifting of said magazine shafts into alignment with the respective feed magazines, and means for linearly lifting respective stacks of said elements along said elevator shafts into said magazine shafts; and

means engageable from below with the stacks lifted into said magazine shafts by said elevator means for retaining the stacks in said magazine shafts during shifting of said magazine shafts into alignment with the respective feed magazines.

4,796,407

METHOD AND FITTINGS ENABLING ARTICLES TO BE RAPIDLY TAKEN INTO AND OUT OF A CASE

Ko-Lin Sun, No. 4, Song Bor Lane, Fu Shing Road, Li Shan Tsuen, Tai Chung Shian, Taiwan

Filed Jul. 30, 1987, Ser. No. 79,517

Int. Cl.[4] B65B *35/30, 5/06, 67/02*

U.S. Cl. 53—390 **14 Claims**

1. A method for packing articles into a case or container having a plurality of holes in a bottom wall comprising the steps of:

(a) providing a stationary base having a plurality of rods extending upwardly therefrom, the rods having first ends inserted into the base and second ends;

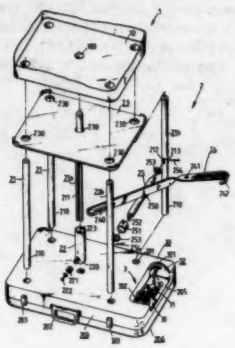
(b) providing a slide plate having a plurality of holes to allow passage of the plurality of rods;

(c) providing means to raise and lower the slide plate;

(d) placing a empty case on the slide plate;

(e) lowering the slide plate and case such that the second ends of the plurality of rods extend through the holes in the bottom wall of the case;

(f) supporting the articles to be packed on the second ends of the plurality of rods; and,



(g) raising the slide plate and the case until the case surrounds the articles.

4,796,408

METHOD AND APPARATUS FOR VACUUM PACKAGING

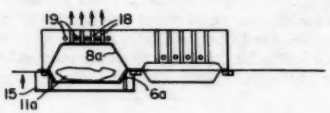
Bengt U. Mobark, Hollviken, Sweden, assignor to W. R. Grace & Co., Duncan, S.C.

Filed Jul. 27, 1987, Ser. No. 78,445

Claims priority, application United Kingdom, Nov. 14, 1986, 8627252

Int. Cl.[4] B65B *11/52, 31/02, 47/02, 47/10*

U.S. Cl. 53—427 **15 Claims**



1. A vacuum packaging process, comprising placing a product between two sheets of plastic film; drawing one of the sheets of film away from the product into contact with a heated mould cavity for both partly deforming the sheet and heating it by conduction; and then drawing said one of the film sheets into a deeper mould cavity for further heating and deforming said one film sheet away from the product; subjecting the space between the two film sheets to vacuum; and causing the said one sheet to contact the top and sides of the product thereby moulding said one sheet to the shape of the product and causing said one sheet to contact the other film sheet to form a sealed pack.

4,796,409

PRODUCTION OF TEA AND THE LIKE BAGS

James R. Rimmer, Wirral, and Ronald M. Sweeney, West Kirkby, both of England, assignors to Premier Brands U.K. Limited, Birmingham, England

Division of Ser. No. 849,480, Apr. 8, 1986, Pat. No. 4,712,358. This application Jun. 11, 1987, Ser. No. 61,881

Int. Cl.[4] B65B *29/02, 35/30, 63/02*

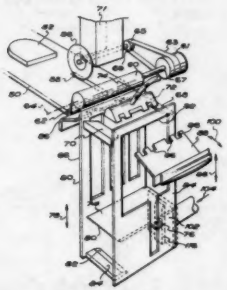
U.S. Cl. 53—438 **2 Claims**

1. A method of producing and packaging tea or the like bags comprising the steps of:

(a) moving a first web of material along a horizontal path;

(b) placing individual and spaced portions of tea in parallel rows on the first web;

(c) applying a second web over the first web and said rows of tea portions;
(d) sealing said first and second webs together to form a web of rows of tea bags;
(e) severing the web of tea bags into individual tea bags;
(f) stacking the individual tea bags in parallel stacks in a magazine;



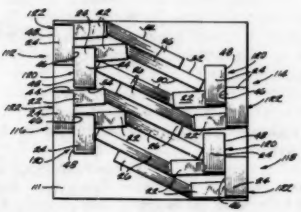
(g) displacing the parallel stacks from the magazine into an insertion mechanism;
(h) pushing the stacks of tea bags together to reduce the overall width of the stacks; and
(i) inserting the pushed together stacks of tea bags by the insertion mechanims in a tea bag carton.

4,796,410

METHOD AND APPARATUS FOR SHIPPING AND STORING PORTABLE AUTOMOBILE RAMPS

Philip L. Lundman, 3631 Fredonia-Kohler Dr., Fredonia, Wis. 53021

Filed Jun. 30, 1987, Ser. No. 68,230
Int. Cl.[4] B65B *35/56*
U.S. Cl. 53—446 **7 Claims**



1. A method for storing a plurality of portable automobile ramps, the ramps each including a platform having opposite ends and an upper surface for supporting an automobile tire, a leg extending downwardly from one end of the platform, and a ramp extending at an incline downwardly from the other end of the platform, said method comprising the steps of

providing a plurality of substantially identical containers, each of said containers housing at least one of said automobile ramps and having a shape conforming to the at least one ramp housed therein, and each of said containers including a body portion for enclosing the platform of a respective ramp, said body portion including opposite ends, a leg portion for enclosing the leg of said respective ramp, said leg portion being integrally connected to said body portion and extending generally perpendicularly from one end of said body portion, and a ramp portion for enclosing the ramp of said respective ramp, said ramp portion being integrally connected to said body portion and extending obliquely from the opposite end of said body portion,

providing a pallet, and

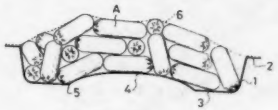
arranging said containers in nested relationship on said pallet.

4,796,411

PACKAGING FOOD IN RAISED STATE

Masatoshi Kimura; Hiroshi Okuda; Yujiro Fujikawa, and Tatsuaki Inomata, all of Tsuchiura, Japan, assignors to Prima Meat Packers, Ltd. Research and Development Center, Tsuchiura, Japan

Filed May 6, 1987, Ser. No. 48,538
Claims priority, application Japan, May 6, 1986, 61-103397
Int. Cl.[4] B65B *47/00, 47/10*
U.S. Cl. 53—453 **3 Claims**



1. A method of packaging of pieces of food in a raised state, comprising the steps of:

forming a projecting wall portion integrally with and in the central section of a bottom wall of container, said wall portion projecting towards the outside of the lower surface of said bottom wall;

inserting the pieces of food in said container with said wall portion maintained so as to project towards the outside of the lower surface of said bottom wall;

sealing the opening of said container with a film; and

applying pressure on the outside surface of said wall portion of said sealed container so that said wall portion is pressed upwardly, said wall portion projecting into said container forming a recess on an underside surface of the package, thereby raising the pieces of food by the food-raising force of said inwardly-projected wall portion to a level above the plane of the upper end of said container against the tension of said film to form a bulge extending above the plane of the upper end of said container.

4,796,412

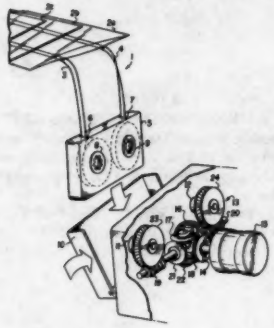
METHOD OF PACKAGING UTILIZING A TAPED BAG CHAIN WITH CASSETTE

Ronan R. O'Neill, Varese, Italy, assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 806,909, Dec. 9, 1985, Pat. No. 4,693,372. This application Apr. 1, 1987, Ser. No. 102,979
Claims priority, application United Kingdom, Jun. 14, 1985, 8515097
Int. Cl.[4] B65B *43/12*
U.S. Cl. 53—473 **3 Claims**

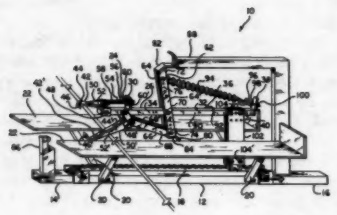
1. A method of loading a bag chain on a bag loader, comprising taking a bag chain incorporating a succession of imbricated packaging bags on two supply tapes from which they are removed during the loading operation, the supply tapes having lead ends equipped with tape-winding rotors which are supported on spacing means to hold them with substantially parallel axes of rotation; attaching the tape-winding rotors to parallel drive shafts of a bag indexing drive unit; operating the bag indexing drive unit to bring each of the imbricated bags successively to a loading position where the bag is loaded and separated from the tapes; and, after separation of most or all of the

bags from the tapes, removing the tape-winding rotors and spacing means from the bag indexing drive unit and replacing



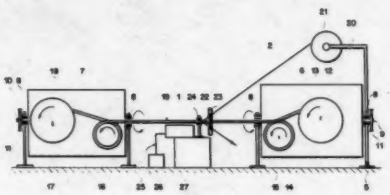
them by a fresh pair of tape-winding rotors and spacing means with imbricated taped bags already attached.

4,796,413
TREE BALER
Wayne Howe, 5330 Tacoma St. NE., Brooks, Oreg. 97305
Filed Dec. 28, 1987, Ser. No. 138,570
Int. Cl.[4] B65B *13/20, 63/02*
U.S. Cl. 53—530 **7 Claims**



1. A tree baling apparatus for attachment to a motor driven pulley chain comprising; traveling jaw means having both an open and a closed position for clamping on a tree when pressed toward said closed position and releasing the tree when urged toward said open position; means for reciprocating said jaw means along a path; traveling upper contact means and traveling lower contact means for opening said jaw means; stationary limiting means fixed to said tree baling apparatus for abutment to said upper and lower contact means at the ends of said path; a traveling horizontally disposed beam connected to said reciprocating means and having a forward section, an intermediate section, and an aft section with said jaw means mounted on said first forward section; a traveling vertical actuator having an upper region, an intermediate region and lower region pivotally attached to said intermediate section of the horizontally disposed beam at the intermediate region of actuator; said upper contact means and said lower contact means being on the upper region and lower region of said vertical actuator; and linkage means connecting said jaw means and said actuator for driving said jaw means toward said open position by said actuator being pushed by said abutment on said upper and lower contact means and means connected to said actuator and linkage means for closing said jaw means when said contact and limiting means are out of abutment.

4,796,414
INSTALLATION AND METHOD FOR PRODUCING AN OPTICAL CONDUCTOR
Remy Bruggmann, Brent, and Philipp De Boer, Nyon, both of Switzerland, assignors to Maillefer S.A., Switzerland
Filed Jun. 30, 1987, Ser. No. 68,066
Claims priority, application Switzerland, Jul. 3, 1986, 02719/86
Int. Cl.[4] G02B *6/04;* H01B *13/02;* D01H *7/00*
U.S. Cl. 57—6 **14 Claims**



1. An installation for fitting a group of optical fibers into longitudinal grooves of a rod, comprising:

two capstans having parallel axes, capable of moving said rod continuously along a predetermined straight section of path and for applying to said rod a fixed elastic tension within said section,

capstan-supporting means and optical-fiber payout reels for producing a relative rotary movement about the axis of said rod between said fibers as a whole and the portion of said rod within said section, and

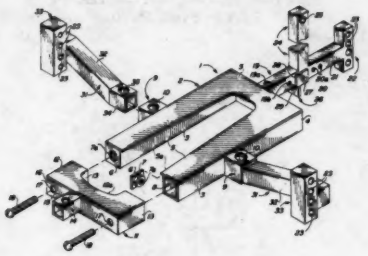
means, disposed adjacent to the point of entry of said fibers into said grooves, for causing said fibers to adhere at least momentarily to the walls of said grooves, said means for causing said fibers to adhere comprising an ionizer device disposed between said capstans in proximity to said rod.

11. An installation for manufacturing an optical fibers cable comprising a core with helical grooves having parallel walls therein and with optical fibers loosely encompassed between said walls, said installation comprising a pay-out device delivering said core, at a given speed, feeding means for freely delivering said optical fibers, dispensing means for causing said optical fibers to enter said grooves, a take-up device for said core having said fibers in said grooves, and driving means for both said pay-out and take-up devices, said dispensing means being located between said pay-out and take-up devices, said driving means being arranged for permanently subjecting a section of said core extending between said devices to an elastical elongation $\Delta L/L$, and said installation further comprising an adhering device located outwardly of said core, acting on said core and said fibers and at least temporarily adhering said fibers to the walls of said grooves during the travel of said cable from said dispensing means to said take-up device.

4,796,415
DOLLY FOR LINE TRIMMING APPARATUS
Mark R. Moore, 268 Settlers Park Dr., Shreveport, La. 71115
Filed Oct. 26, 1987, Ser. No. 112,374
Int. Cl.[4] A01D *34/67, 34/46*
U.S. Cl. 56—16.9 **19 Claims**

1. A dolly for a line trimming apparatus comprising a dolly frame adapted to receive and mount the line trimming apparatus; cap means removably carried by one end of said dolly frame for securing the line trimming apparatus to said dolly frame and cap receptacle means provided on said cap means; first and second leg receptacle means provided on opposite sides of said dolly frame; at least two frame leg means selectively and removably carried by said first and second leg receptacle means, and said cap receptacle means, respectively, said frame leg means extending outwardly of said dolly frame and

said cap means; and at least two frame wheels rotatably attached to said frame leg means, respectively, whereby said



dolly frame is mobile in a selected configuration for cutting grass responsive to operation of the line trimming apparatus.

4,796,416

PORTABLE SHREDDER/LAWN MOWER FOR GARDEN USE AND THE LIKE

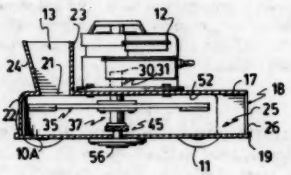
Thomas J. Bendig, and Donna A. Bendig, both of P.O. 26, Bruno, Saskatchewan, Canada S0K 0S0

Filed Aug. 17, 1987, Ser. No. 85,774

Claims priority, application Canada, Aug. 29, 1986, 517261

Int. Cl.[4] B02C *18/10*; A01D *55/18*

U.S. Cl. 56—16.9 **19 Claims**



1. A shredder for relatively soft garden refuse and the like comprising in combination a susbtantially rectangular frame having an upper plate, a vertical surrounding wall and a base plate substantially spaced and parallel to said upper plate, an internal, cylindrical blade enclosure within said frame, an intake chute on said internal enclosure adjacent the upper side thereof and communicating through said wall and a discharge chute on said internal enclosure and also communicating through said wall, a source of power mounted on said upper plate with a substantially vertical drive shaft extending downwardly therefrom, at least two shredder blade assemblies in said internal enclosure and meanns mounting said shredder blade assemblies to said drive shaft for rotation in a substantially horizontal plane within said internal enclosure, and in spaced apart relationship, one adjacent the underside of said upper plate and the other adjacent the upper side of said lower plate, said means mounting said shredder blade assembly for rotation in a substantially horizontal plane to said drive shaft including a spacer coupling between said blades with said upper blade being detachably secured to the upper end of said spacer coupling and the lower blade being detachably secured to the lower end of said coupling and means securing said coupling to said drive shaft whereby said coupling and said blades rotate therewith, ground engaging wheels mounting said frame for ease of movement, a handle assembly extending upwardly and outwardly from one side of the said frame, and further means detachably securing said spacer coupling into said shaft, said further means including a drive coupling secured to the distal end of said drive shaft and extending into said internal blade enclosure substantially centrally through the upper plate of said frame, the upper end of said spacer coupling being secured to the lower end of said drive coupling with said upper blade being clamped therebetween, a bearing shaft being secured axially to said spacer coupling and extending downwardly therefrom and a bearing assembly in said base plate, the lower end of said bearing shaft being supported for rotation within said bearing assembly.

4,796,417

BALERS

Cornelis van der Lely, Zug, Switzerland, assignor to Texas Industries Inc., Netherlands

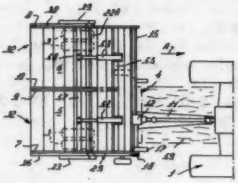
Division of Ser. No. 676,298, Nov. 29, 1984, Pat. No. 4,651,512. This application Dec. 23, 1985, Ser. No. 812,763

Claims priority, application Netherlands, Dec. 1, 1983, 8304135

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] A01D *39/00*

U.S. Cl. 56—341 **10 Claims**



1. A baler comprising a pick-up device for picking up crop from the ground, at least two chambers for receiving said crop which has been picked-up by said device and forming said crop which has been picked-up by said device into bales, and means for laterally displacing said pick-up device with respect to said chambers.

4,796,418

APPARATUS FOR JOINING TWO THREAD ENDS BY SPLICING

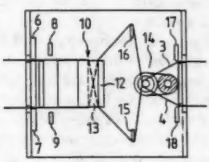
Arthur Rebsamen, Stallikon, and Bruno Hablützel, Horgen, both of Switzerland, assignors to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Apr. 1, 1987, Ser. No. 33,521

Claims priority, application Switzerland, Apr. 5, 1986, 1330/86

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—22 **6 Claims**



1. Apparatus for splicing together two thread ends which are disposed in spaced parallel position and are subsequently cut, said apparatus comprising:

first means to subject the two cut ends to a single air flow to

prepare the ends by untwisting them and removing loose thread parts therefrom;

second means to place the prepared ends in a splicing chamber; and

third means to direct compressed air upon said ends in the chamber to splice together said ends, said first means including a single thread end preparation device at least partially constructed as a preparation tube, said device having an air gap for thread end introduction which is disposed at right angles to the preparation tube, said device having an air intake tube having an axis and a discharge mouth defining a surface disposed at an angle less than ninety degrees with respect to the axis of the tube.

4,796,419

BEARING SUPPORT FOR A TWISTING OR SPINNING MACHINE

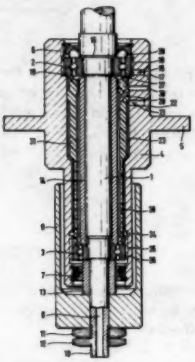
Hans Braxmeier, Süssen, Fed. Rep. of Germany, assignor to Novibra GmbH, Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 7,200

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3603999

Int. Cl.[4] D01H *7/20, 7/12;* F16C *33/66*

U.S. Cl. 57—134 **12 Claims**



1. Spinning or twisting spindle assembly having at least one spindle shaft comprising:

at least two supporting bearing means for supporting said shaft;

bearing housing means in which said supporting bearing means are disposed;

lubricant feeding and discharging duct means for feeding and discharging lubricant to and from said at least two supporting bearing means, said lubricant feeding and discharging duct means including at least one lubricant feeding duct for each of said at least two supporting bearing means and at least one lubricant discharging duct for each of said at least two supporting bearing means;

at least one outlet discharging means through which lubricant is discharged out of said bearing housing means; and

at least one inlet feeding means for feeding lubricant into said bearing housing means, said at least one inlet feeding means being disposed adjacent said at least one outlet discharging means.

4,796,420

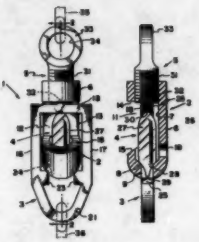
FUSIBLE LINK CONSTRUCTION

Carmen Gueli, Saginaw, Mich., assignor to Van Wormer Management Corporation, Standish, Mich.

Filed Nov. 13, 1987, Ser. No. 119,956

Int. Cl.[4] F16G *15/10*

U.S. Cl. 59—93 **15 Claims**



1. A fusible link construction comprising a first body having in one side thereof a recess terminating at one end in a ledge member; a second body having an arm member accommodated in said recess for movements toward and away from said ledge member; a thermally sensitive, collapsible strut reacting between said bodies, said strut having its opposite ends seated on the respective bodies and normally maintaining said arm member spaced from said ledge member; and means carried by said bodies for coupling them to force applying means operable to effect relative movement of said bodies in response to collapse of said strut and in such direction as to cause said arm member to move toward engagement with said ledge member, said members being so configured that engagement therebetween effects ejection of said arm member from said recess and separation of said bodies.

4,796,421

ARRANGEMENT FOR OPEN-END ROTOR SPINNING

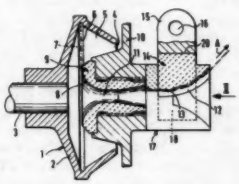
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 149,178

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705319

Int. Cl.[4] D01H *7/882*

U.S. Cl. 57—417 **11 Claims**



1. Open-end rotor spinning apparatus comprising:

a spinning rotor rotatable about a substantially horizontal rotor axis and including a spinning surface means for forming yarn;

a yarn withdrawing means comprising a first part for receiving yarn and deflecting means downstream of said first part for deflecting yarn withdrawn from said rotor, said deflecting means including at least one false-twisting edge facing downwardly, and

a fiber part collecting recess disposed below said deflecting means for collecting fiber parts rubbed off at the deflect-

ing means without interfering with spinning and yarn withdrawal operations.

4,796,422

APPARATUS FOR TREATING TAIL YARN IN TEXTILE SPINDLE ASSEMBLY

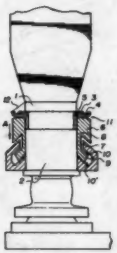
Kunimitsu Odawara, Hirosima, Japan, assignor to Odawara Industry Co., Ltd., Hirosima, Japan

Filed May 17, 1988, Ser. No. 194,886

Claims priority, application Japan, May 26, 1987, 62-130632; Dec. 20, 1987, 62-333155

Int. Cl.[4] D01H *1/38, 1/40, 9/16*

U.S. Cl. 57—299 4 Claims



1. An apparatus for treating a tail yarn in a textile spindle assembly which comprises an upper slit ring fixedly mounted on a base portion of the spindle, a cylindrical member having a lower slit ring at an upper end thereof and a lower portion outwardly expandable by centrifugal force, and a guiding surface fixed on a lower part of said base portion of the spindle, said cylindrical member being axially slidably fitted on said base portion of the spindle beneath said upper slit ring, said cylindrical member being mounted so that a lower end of the expandable portion thereof capably comes into contact with said guiding surface, said upper slit ring and said lower slit ring being pressed together to form a tail yarn gripping means, whereby expansion of said lower portion of said cylindrical member by centrifugal force causes said cylindrical member to slide axially downward to release a pressed state between said upper slit ring and said lower slit ring.

4,796,423

SHEET METAL PANEL

Louis Lievestro, West Chester; James S. Kelm, Milford; Arthur L. Ludwig; Harvey M. Maclin, both of Cincinnati, and Thomas G. Wakeman, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 786,722, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 562,566, Dec. 19, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 4,827

Int. Cl.[4] F02G *1/00, 3/00*

U.S. Cl. 60—39.33 28 Claims

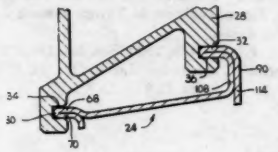
1. A gas turbine engine with an annular flowpath, said engine having:

a compressor, combustor, and turbine in serial flow communication within said flowpath; and

a sheet metal panel attached to a support and defining at least one portion of said flowpath in said turbine, wherein said sheet metal panel comprises:

a bent region for attaching said sheet metal panel to said support wherein said support includes a slot and said bent region is inserted in said slot;

said region defining a first arc of intersection with a first plane and defining a second arc of intersection with a



second plane, wherein said second arc has a radius of less than twice the thickness of said sheet metal panel.

4,796,424

INTAKE FOR A TURBOPROPELLER GAS TURBINE ENGINE

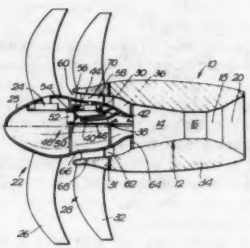
Peter G. G. Farrar, Derby; Eric Wright, Nottingham, and Nicholas J. Peacock, Derby, all of England, assignors to Rolls-Royce plc, London, England

Filed Jul. 22, 1987, Ser. No. 76,712

Claims priority, application United Kingdom, Oct. 16, 1986, 8624833

Int. Cl.[4] F02K *3/02*

U.S. Cl. 60—268 8 Claims



1. A turbopropeller gas turbine engine comprising a gas generator, an upstream propeller, a downstream propeller, shaft means, gear means and intake means,

the gas generator comprising in flow series compressor means, combustor means and turbine means,

the upstream propeller and the downstream propeller being positioned upstream of the gas generator, the turbine means being arranged to drive the upstream propeller and the downstream propeller via the shaft means and the gear means,

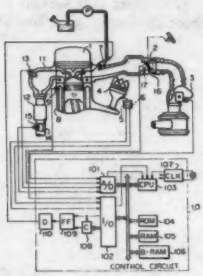
the intake means supplies air to the gas generator, the intake means comprises an intake opening and an intake duct, the intake opening being positioned axially between the upstream propeller and the downstream propeller, the intake duct being defined at its radial extremity at least partially by a spinner of the downstream propeller whereby the intake duct extends axially through the downstream propeller.

4,796,425

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM CARRYING OUT LEARNING CONTROL OPERATION

Toshinari Nagai, Ann Arbor, Mich., and Nobuaki Kayanuma, Gotenba, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 8, 1987, Ser. No. 105,702
Claims priority, application Japan, Oct. 13, 1986, 61-241484
Int. Cl.[4] F02D 41/14
U.S. Cl. 60—274 44 Claims



1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

calculating a first air-fuel ratio correction amount in accordance with the output of said upstream-side air-fuel ratio sensor;

determining whether said engine is in an air-fuel ratio feedback control state or in an open control state for said downstream-side air-fuel ratio sensor;

calculating a second air-fuel ratio correction amount in accordance with the output of said downstream-side air-fuel ratio sensor when said engine is in said air-fuel ratio feedback control state;

determining whether or not said engine is in a learning control state;

calculating a period of the output of said upstream-side air-fuel ratio sensor;

determining a region defined by the output period of said upstream-side air-fuel ratio sensor;

calculating a center value of said second air-fuel ratio correction amount when said engine is in said learning control state and said calculated period remains in the same region;

storing said center value of said second air-fuel ratio correction amount of the same region;

setting said center value of said second air-fuel ratio correction amount stored for the current region in said second air-fuel ratio correction amount when said engine is transferred from said open control state to said air-fuel ratio feedback control state or when said calculated period is transferred to a different region in said air-fuel ratio feedback control state; and

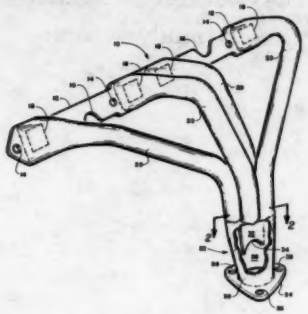
adjusting an actual air-fuel ratio in accordance with said first and second air-fuel ratio correction amounts.

4,796,426

HIGH EFFICIENCY TRANSITION ELEMENT POSITIONED INTERMEDIATE MULTI-CYLINDER EXHAUST SYSTEM AND SECONDARY PIPE ASSEMBLIES

James J. Feuling, 686 Ash Ave., Chula Vista, Calif. 92010

Continuation of Ser. No. 394,910, Jul. 6, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,218
Int. Cl.[4] F02B 27/02; F01N 7/10
U.S. Cl. 60—313 17 Claims



1. An improved transition means for use with multi-cylinder engine exhaust systems comprising:

multi-cylinder exhaust gas input means, said multi-cylinder input means being adapted for accepting a plurality of separate tubular inputs, one input from each cylinder of at least one side of said engine;

a single exhaust gas output means;

an open chamber positioned intermediate said exhaust input means and said exhaust output means; and

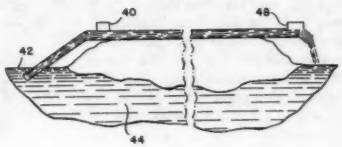
a thin flat blade member terminating at its downstream end within said open chamber and forming a gas tight seal between at least two of said plurality of separate tubular inputs at its upstream end, said thin flat blade member has an inwardly directed cutout across its downstream blade surface.

4,796,427

METHOD OF IMPARTING ENERGY TO LIQUIDS

Craig H. Zeyher, 660 Clinton Ave., Haddonfield, N.J. 08033

Continuation-in-part of Ser. No. 733,656, May 13, 1985, abandoned. This application May 21, 1987, Ser. No. 58,651
Int. Cl.[4] F03B 13/00
U.S. Cl. 60—398 6 Claims



1. A method of generating electrical power, which comprises:

a. providing liquid-conduit means;

b. furnishing liquid to said means;

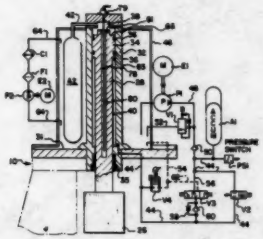
c. longitudinally orienting said means in the centrifugal force field of the earth to produce flow of liquid within said means to develop a velocity head sufficient to drive a turbo-generating system to produce electrical power.

4,796,428

DOUBLE-ACTING FORGING HAMMER AND METHOD

Richard W. Hall, Springfield, Ohio, assignor to Oilgear Towler, Inc., Milwaukee, Wis.

Filed Jan. 17, 1983, Ser. No. 458,598
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—413 2 Claims



1. A double-acting accelerated forging hammer in which a vertically movable hammer ram is mounted on a hammer frame, for imparting a predetermined and controlled amount of blow energy in said ram, comprising:

a cylinder having a rod and piston therein defining a closed end above said piston and an annulus region between the cylinder and said piston rod,

means connecting said rod to said ram,

a source of hydraulic fluid,

a high pressure hydraulic pump connected to draw hydraulic fluid from said source,

a hydraulic accumulator connected to receive hydraulic fluid under high pressure from said pump,

pressure switch means connected to maintain said hydraulic accumulator at a predetermined high fluid pressure,

a gas accumulator having a substantial volume compared to the volume in said cylinder at said closed end for storing a quantity of gas under pressure with said gas at a substantially lower pressure than that of hydraulic fluid in said hydraulic accumulator for applying a relative constant bias to said piston to provide a relatively uniform acceleration to said ram,

means connecting said gas accumulator to said cylinder closed end,

first controllable valve means for applying fluid under pressure from said hydraulic accumulator to said annulus region, variable valve means connected to exhaust fluid from said annulus region to said source at a controlled rate to allow the fall of said ram under the influence of gravity and said gas pressure on said piston, and

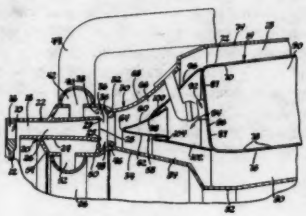
control means, including means responsive to the position of said ram, for closing said first valve means at a given ram elevation, for opening said variable valve means providing for the fall of said ram, and thereafter for closing said variable valve means and opening said first valve means to apply pressure from said hydraulic accumulator to said annulus to effect a rapid rise in hydraulic pressure therein for controlling rebound and reinitiating upward movement of said ram, and said control means closes said variable valve means just prior to ram impact and immediately thereafter opens said first valve means, to control rebound of the ram.

4,796,429

COMBUSTOR DIFFUSER

Albert J. Verdouw, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1976, Ser. No. 742,289
Int. Cl.[4] F02C 1/00
U.S. Cl. 60—751 4 Claims



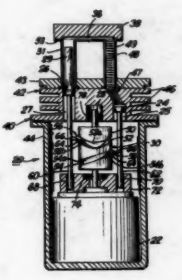
1. A diffuser assembly for distributing high velocity inlet air to the inside and outside walls of an annular combustor having an inlet dome, the assembly comprising: an inlet prediffuser having an inner wall and an outer wall defining an annular inlet and an annular outlet with a divergent flow passage from the inlet to the outlet to produce a useable pressure at the outlet of said prediffuser, said inlet prediffuser having a ratio of outlet area to inlet area of about 1.5, a vortex controlled diffuser downstream of said prediffuser having inner and outer annular fences, said inner and outer walls each having an end surface arranged in spaced axial relationship to said fences to form gaps to bleed air and form vortices and to maintain a uniform flow into the vortex diffuser, said vortex controlled diffuser having a ratio of inlet area to outlet area of about 1.8, said bleed gaps directing about 8% of total inlet air flow from said diffuser assembly, said vortex diffuser having an outlet, splitter means including a pair of constant area passages having a length to height ratio of about 5.0 for uniformly distributing the air flow from said vortex diffuser outlet to the inside wall, outer wall and dome of said combustor to produce a substantially equal pressure condition at the walls of the combustor.

4,796,430

CAM DRIVE FOR CRYOGENIC REFRIGERATOR

Stephen F. Malaker, Mountainside, N.J., and Alfred Gorawski, Westmoreland, N.H., assignors to Cryodynamics, Inc., Mountainside, N.J.

Filed Aug. 14, 1987, Ser. No. 85,536
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—6 20 Claims



1. A modified Stirling cycle refrigerator having a first piston for compressing a working gas in a first cylinder, a second piston for expanding the working gas in a second cylinder, a

channel connecting the cylinders, and a cold head in thermal contact with the working gas in the second cylinder, comprising

first and second camming elements mounted for rotation at a phase angle with respect to one another;

a first cam follower mounted in contact with said first camming element and coupled to said first piston for reciprocally driving said first piston in said first cylinder in response to rotation of said first camming element;

a second cam follower mounted in contact with said second camming element and coupled to said second piston for reciprocally driving said second piston in said second cylinder at a predetermined phase angle with said first piston in response to rotation of said second camming element; and

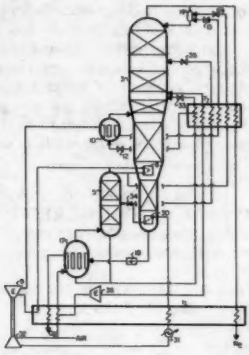
motive means for rotating said first and second camming elements.

4,796,431

NITROGEN PARTIAL EXPANSION REFRIGERATION FOR CRYOGENIC AIR SEPARATION

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Jul. 15, 1986, Ser. No. 885,868
Int. Cl.[4] F25J 3/04
U.S. Cl. 62—31 **20 Claims**



1. A process for obtaining at least one of oxygen and nitrogen from pressurized, cooled, and cleaned supply air by cryogenic distillation in an apparatus comprised of at least a high pressure rectifier and a low pressure distillation column, comprising:

(a) introducing at least part of a vapor obtained from said supply air into the HP rectifier;

(b) withdrawing pressurized gaseous nitrogen from the HP rectifier and superheating it;

(c) partially expanding the superheated nitrogen to an intermediate pressure;

(d) condensing said partially expanded nitrogen by latent heat exchange with at least one of LP distillation column intermediate height liquid and at least part of the depressurized kettle liquid;

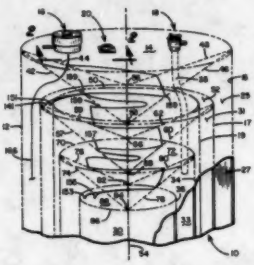
(e) refluxing at least one of the HP rectifier and the distillation column by direct injection of the condensed nitrogen.

4,796,432

LONG HOLD TIME CRYOGENS DEWAR

Dale J. Fixsen, St. Louis Park; Roger N. Hastings, Burnsville, and John A. Imsdahl, Richfield, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 9, 1987, Ser. No. 79,200
Int. Cl.[4] F17C 1/00
U.S. Cl. 62—45 **20 Claims**



1. In a dewar for maintaining superconducting temperatures for an extended period of time comprising an outer case, comprising a plurality of cryogen containing chambers, the improved structure wherein the dewar is constructed so that each of said cryogen chambers completely surrounds the next innermost one of said cryogen chambers, and, except for the innermost one of said cryogen chambers, the cryogens contained in each of said chambers are maintained in states such that each cryogen has a progressively higher phase change temperature proceeding from the innermost one of said cryogen chambers to the outermost one of said cryogen chambers and isothermal suspension means for suspending all of said cryogen chambers within the dewar wherein the outermost one of said cryogen chambers is suspended in said dewar solely by isothermal suspension means comprising rods having a low thermal conductivity and all of said cryogen chambers, except said outermost cryogen chamber, are suspended in said dewar solely by isothermal suspension means comprising cords having a low thermal conductivity.

4,796,433

REMOTE RECONDENSER WITH INTERMEDIATE TEMPERATURE HEAT SINK

Allen J. Bartlett, Milford, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Jan. 6, 1988, Ser. No. 141,996
Int. Cl.[4] F17C 13/00
U.S. Cl. 62—54 **28 Claims**

1. A cryogenic recondenser for recondensing cryogen retained in a storage vessel having a radiation shield, the recondenser comprising:

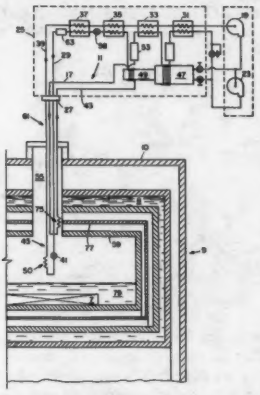
cooling means positioned outside of the storage vessel, the cooling means having a mechanical refrigerator and precooling a volume of working gas;

an intermediate transfer line leading from an intermediate portion of the cooling means into the storage vessel;

an end of the intermediate transfer line in the storage vessel being in thermal communication with but out of physical contact with the radiation shield of the storage vessel, partially pre-cooled gas being transferred in the intermediate transfer line from the intermediate portion of the cooling means to the end of the intermediate transfer line and back to the cooling means for further cooling, said transferring being in a manner such that the end of the intermediate transfer line through the partially pre-cooled gas removes heat from the radiation shield; and

a final transfer line removeably leading into the storage

vessel from the cooling means, an end of the final transfer line in the storage vessel being in heat exchange relation with boil-off from the cryogen retained in the storage



vessel, pre-cooled gas being transferred in the final transfer line from the cooling means to the end of the final transfer line in the storage vessel in a manner which cools and recondenses the boil-off.

4,796,434

APPARATUS FOR DELIVERING A MEASURED AMOUNT OF A LOW-BOILING LIQUEFIED GAS

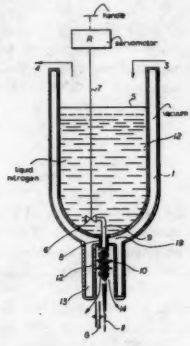
Franz Garnreiter, Föhrenstrasse 26, D-8206 Bruckmühl, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 126,217

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642199

Int. Cl.[4] F17C *7/02*

U.S. Cl. 62—55 **7 Claims**



1. An apparatus for metering or delivering a measured amount of a low-boiling liquefied gas comprising:

a thermally insulated container provided with an outlet for said liquefied gas;

a cylindrically shaped fleece made of natural material, plastic material or metal connected with said outlet extending immediately downstream of said outlet coming to a point on the side of said fleece furthest from the side of said fleece adjacent or closest said outlet of said container;

a cylindrical shroud for said fleece open at the end of said shroud furthest from said outlet so that a gap is present between said fleece and said shroud; and

a precision regulating valve submerged in said liquefied gas mounted adjacent the bottom of said container, said precision regulating valve being connected with said outlet and being connectable to a regulating device located outside of said container.

4,796,435

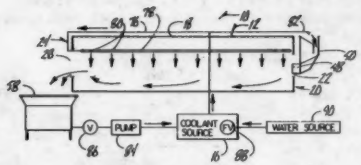
BY-PRODUCTS CHILLER AND METHOD FOR USING SAME

Glenn H. Mattson, Chanhassen, Minn., assignor to Omaha Cold Storage Terminals, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 856,469, Apr. 28, 1986, Pat. No. 4,700,546. This application Dec. 22, 1986, Ser. No. 945,372

Int. Cl.[4] F25D *13/06, 17/02*

U.S. Cl. 62—63 **21 Claims**



1. A by-products and hide chiller, comprising:

an elongated tank having an inlet end for introducing fresh animal by-products into said tank and an outlet end for removing said by-products from said tank;

said tank having a sidewall extending between said inlet and outlet ends, said sidewall being void of apertures;

support means for rotatably supporting said tank;

means for introducing a liquid coolant from a coolant source into said tank so as to partially fill said tank with a body of liquid coolant for bathing and thereby cooling said by-product or hides therein;

said liquid coolant draining from said tank from said outlet end of said tank;

circulation means for recirculating said liquid coolant drained from said tank to said coolant source for re-cooling thereby and for subsequent re-introduction into said tank for cooling additional by-products or hides therein; and

means operatively secured to said tank for rotating said tank about its longitudinal axial such that said by-products or hides are tumbled within said tank and bathed in said coolant and chilled thereby.

4,796,436

HEAT PUMP CHARGING

Roger J. Voorhis, Liverpool, and John M. Palmer, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

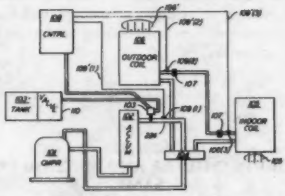
Filed Dec. 9, 1986, Ser. No. 939,825

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—77 **2 Claims**

1. The method of charging a heat pump system including a compressor for circulating refrigerant between indoor and outdoor coils, comprising the steps of attaching a source of refrigerant to the heat pump system at a charging port, successively monitoring indoor coil inlet and suction temperatures, comparing said indoor coil inlet and suction temperatures

successively to establish successive temperature differences therebetween, comparing said successive temperature differ-



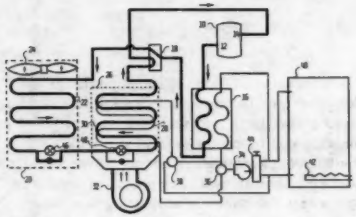
ences and halting charging operation when said comparisons attain a predetermined threshold.

4,796,437

MULTIFLUID HEAT PUMP SYSTEM

Larry S. James, 1749 Mount Ephraim Rd., Adamstown, Md. 21710

Filed Oct. 23, 1987, Ser. No. 111,635
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—79 **6 Claims**



1. A method of heating or cooling an indoor space and/or heating or cooling a stored liquid comprising the steps of:

operating a heat pump to transfer heat between and among an indoor heat exchange coil located within the conditioned space, outdoor heat exchange coil located outside of the conditioned space and a desuperheat exchange means;

transferring heat between the indoor coil and the conditioned space by passing ambient air over the indoor coil;

storing heat transferred between the indoor coil of a multifluid heat exchange means and/or the desuperheat exchange means and the outdoor coil by circulating a stored liquid between a heat storage facility and the second heat exchange coil of the multifluid heat exchange means located in thermal contact with the indoor coil, and/or selectively circulated through the liquid coil of the desuperheat exchange means; or

storing "cool" transferred between the indoor coil and the outdoor coil by circulating a stored liquid between a cool storage facility and the second heat exchange coil of the multifluid heat exchange means located in thermal contact with the indoor refrigerant coil of the multifluid heat exchange means; and

transferring stored heat/cool between the heat/cool storage facility and the conditioned space by circulating the stored liquid between the heat/cool storage facility and the second heat exchange coil of the multifluid heat exchanger and passing ambient air over said second heat exchange coil.

4,796,438

METHOD AND APPARATUS FOR CONTROLLING AN AUTOMOTIVE AIR CONDITIONING SYSTEM

Kenichiro Sato, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Oct. 29, 1987, Ser. No. 114,013
Claims priority, application Japan, Oct. 29, 1986, 61-164918[U]
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—133 **4 Claims**

AIR TEMP T BY THERMISTOR	ELECTROMAGNETIC CLUTCH	ACCELERATION DETECTING DEVICE	CAPACITY OF COMP
T≥T	ON	OFF	LARGE
		ON	SMALL
To<T<Th	ON	OFF	SMALL
		ON	SMALL
T≤To	OFF	———	———

1. A control device for controlling the operating capacity of a compressor in an automobile air conditioning system comprising temperature detecting means for detecting air temperature, acceleration detecting means for detecting an accelerating condition of the automobile, and control means for controlling a variable displacement mechanism of said compressor, said control device including:

first comparison means for comparing a first predetermined temperature with a detected air temperature and providing a first control signal when the air temperature is higher than said first predetermined temperature, wherein the operation of said compressor is terminated in the absence of said first control signal,

second comparison means for comparing a second predetermined temperature with said detected air temperature in response to the comparison by the first comparison means and the presence of said first control signal, said second comparison means providing a second control signal when said detected air temperature is higher than said second predetermined temperature, wherein said variable displacement mechanism causes said compressor to operate at a reduced capacity in the absence of said second control signal,

means responsive to the detected acceleration condition of the automobile and the presence of said second control signal for causing said variable displacement mechanism to cause said compressor to operate at a reduced capacity upon the occurrence of a first acceleration condition and at full capacity upon the occurrence of a second acceleration condition.

4,796,439

AIR CONDITIONING SYSTEM

Tetsuo Yamada; Yoshinori Inoue; Sinji Miura; Masao Endo; Setsuo Kaneda, and Yashutoshi Yoshida, all of Osaka, Japan, assignors to Takenaka Komuten Co., Ltd. and Sinko Kogyo Co., Ltd., both of Osaka, Japan

Filed Oct. 28, 1987, Ser. No. 113,761
Claims priority, application Japan, Nov. 5, 1986, 61-264309
Int. Cl.[4] F25B *29/00*
U.S. Cl. 62—159 **6 Claims**

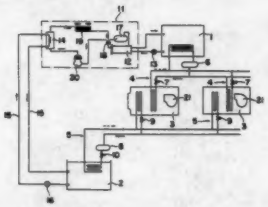
1. An air conditioning system for a building, said system comprising:

a cold thermal source at which a relatively low temperature is developed, said cold thermal source comprising a first thermal storage tank disposed at a relatively high location on the building;

a hot thermal source at which a relatively high temperature is developed as compared to the temperature developed at said cold thermal source, said hot thermal source comprising a second thermal storage tank disposed at a relatively

low location on the building as compared to the location at which said first thermal storage tank is disposed;

a plurality of air conditioners for air conditioning respective areas in the building, each of said air conditioners disposed at a respective location between said first and said second thermal tanks; and



gravity type heat piping extending between and operatively connecting said plurality of air conditioners with said cold and said hot thermal sources for allowing thermal medium to circulate between said cold thermal source and said plurality of air conditioners and between said hot thermal source and said plurality of air conditioners.

4,796,440

ICE CREAM MAKER

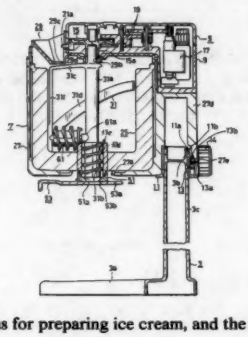
Tadahiko Shiotani, and Hideo Matsuura, both of Aichi, Japan, assignors to Sanyei Corp., Japan

Filed Oct. 19, 1987, Ser. No. 110,209

Claims priority, application Japan, Jan. 28, 1987, 62-10836[U]; Jun. 19, 1987, 62-95206[U]; Jun. 19, 1987, 62-95207[U]; Jun. 19, 1987, 62-95208[U]; Jun. 19, 1987, 62-95209[U]

Int. Cl.[4] A23G *9/12*

U.S. Cl. 62—343 **15 Claims**



1. Apparatus for preparing ice cream, and the like, comprising:

a cold storage container having a bottom; a hole through the bottom; means for selectively opening and closing the hole through the bottom of the cold storage container; a rotary member including a screw which is in the hole through the bottom of the container and the screw being rotatable to move ice cream material from within the container through the hole;

a blade in the container supported to rotate around the inner surface of the container and oriented for moving material down through the container;

material moving means located toward the bottom of the container, supported to move around in the container while located toward the bottom and operable for moving material radially inwardly of the container and toward the hole through the bottom of the container while it also moves around in the container; and

means for both moving the blade and the material moving means together around in the container.

4,796,441

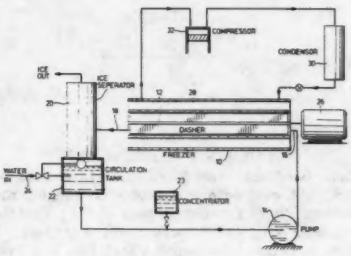
ICE MAKING MACHINE

Vladimir Goldstein, Concord, Canada, assignor to Sunwell Engineering Company Limited, Concord, Canada

Continuation of Ser. No. 739,225, May 30, 1985, abandoned. This application Sep. 28, 1987, Ser. No. 105,951

Int. Cl.[4] F25C *1/00*

U.S. Cl. 62—354 **19 Claims**



1. An ice-making machine comprising housing to receive a fluid from which ice is to be made and having an outlet to permit the egress ice from said housing,

a heat exchanger means located within said housing and having a coolant inlet and a coolant outlet to permit a flow of coolant to extract from said fluid, and including at least one heat exchange surface separating coolant from said fluid,

means to maintain a body of fluid in said housing to fill substantially said housing and cover said heat exchange surface,

blade means in contact with said surface and movable about an axis to move across said surface, and drive means operable upon said blade means to drive said blade means about said axis, said drive means moving said blade means across said surface at a speed such that successive passes of said blade means removes a cooled layer prior to crystallization of ice on said surface, said blade means being configured to discharge fluid from said surface into the body of fluid in said housing to maintain a substantially uniform temperature therein.

4,796,442

ITEM OF JEWELRY INCLUDING A GEM SLIDABLE WITHIN A GEM INSERT

Anthony O. Sarcona, Staten Island, N.Y., assignor to Sarcona Bros., New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,851

Int. Cl.[4] A44C *17/02*

U.S. Cl. 63—26 **2 Claims**

1. An item of jewelry comprising:

a first gem having a top, and a bottom,

a second gem,

said first gem including in its top, a groove that is longer than said second gem for retaining said second gem se-

curely but slidably within the groove, with portions of the second gem that are above and below the groove exposed for public view and,

said groove traversing the first gem and being open at both ends for slidably admitting the second gem,

a housing, removably covering both ends of the groove for retaining the second gem within the groove yet allowing it to slide within the groove, said housing including means for holding the first gem on the item.

4,796,443

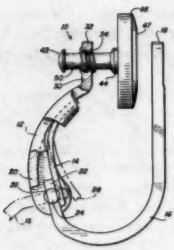
COMFORT EARRING CLIP

A. Karen Bannister, West Warwick, R.I.; Kristen Brandriff, Brooklyn, Conn.; John A. Cariotto, Barrington; Richard J. DiDonato, North Providence, both of R.I.; Virginia Haigh, Bronxville, N.Y., and Edmond Sirois, Providence, R.I., assignors to Trifuri, Krussman & Fishel, Inc., East Providence, R.I.

Filed Feb. 2, 1987, Ser. No. 9,964

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—14.5 **5 Claims**



1. A support device for an earring which device comprises a back support element having pivotally attached thereto a front ear clamping member, a back ear clamping member carried by said back support element which is adjustable to a forward position and to a rearward position with respect to said front ear clamping member, said back ear clamping member being floatably free to move horizontally and vertically when either in the forward or rearward position to conform to the shape and thickness or the earlobe of the wearer of the earring support device.

4,796,444

CIRCULAR WEFT KNITTING MACHINE

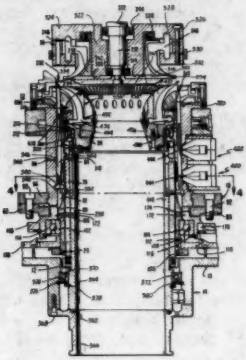
E. C. Tibbals, Jr., Rte. 2, Box 386, High Point, N.C. 27260

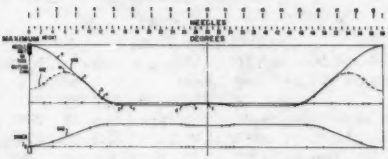
Division of Ser. No. 398,303, Jul. 14, 1982, Pat. No. 4,608,839. This application Aug. 28, 1986, Ser. No. 901,313

Int. Cl.[4] D04B *15/78, 15/06, 35/00*

U.S. Cl. 66—13 **15 Claims**

1. In the circular weft knitting of articles, the step of selectively displacing a yarn engaging hooked end needle element in a discrete vertical and circumferential displacement path in response to knitting cylinder rotation that is symmetric about each of a pair of adjacent yarn feed locations and which is also symmetric about midlocation halfway between said pair of adjacent yarn feed locations





independent of the direction of circumferential displacement thereof effected by said knitted cylinder rotation.

4,796,445

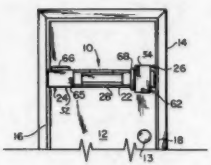
DOOR LOCKING MECHANISM

Howard P. Norden, Jr., 3 Crest Hill Pl., Smithtown, N.Y. 11787

Filed Dec. 15, 1986, Ser. No. 941,597

Int. Cl.[4] E05B *65/10*

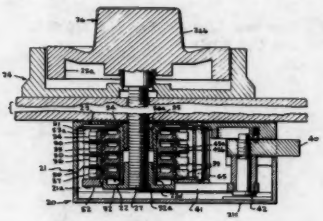
U.S. Cl. 70—94 **6 Claims**



1. An emergency exit door locking mechanism for use on the inside of an outswinging door mounted in the opening of a frame comprising a door mounted in said frame for swinging outwardly to open, stationary bar means permanently mounted on the inside of and spanning substantially the whole width of said door, position means for selectively preventing said door from being opened or being blocked when required as an exit comprising independently operable blocking means mounted at each end of said bar means each movable between a first positive blocking said door against swinging outwardly from said frame and a second position permitting said door to swing outwardly, and each said blocking means comprising a plate for pivoting on each end of said bar means and having means on said movable blocking means for padlocking said blocking means in either of the aforesaid first and second positions so as to prevent said door from being opened or preventing said

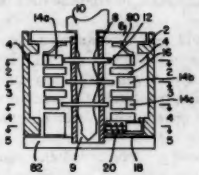
door from being blocked when required as an exit, respectively.

4,796,446
RADIOLOGICAL DETECTION RESISTANT COMBINATION LOCK
Harry C. Miller, 105 Bridle Ct., Nicholasville, Ky. 40356, and Stephen Helesfai, 26 Vassar St., Rochester, N.Y. 14607
Filed Jan. 7, 1987, Ser. No. 1,221
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—316 **23 Claims**



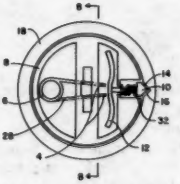
1. A combination lock of the type adapted for changing of the combination by a change key, comprising a lock case having front and rear walls and a cylindrical tumbler post normally extending along a horizontal axis rearwardly from said front wall, a tumbler wheel stack formed of a plurality of tumbler wheels loosely journaled on the tumbler post for rotation about the axis thereof and each including an annular outer rim portion and an inner annular hub portion having formations about its periphery releasably intercoupling the hub portion and rim portion at any of a plurality of relative angular positions, a peripherily gated rotatable driving cam driven by a rotatable dial, means for driviag the tumbler wheels responsive to rotation of the dial and driving cam a fence lever pivotally connected to a bolt for shifting the bolt between locked and unlocked positions, the rim portions of said tumbler wheels having peripheral gates therein to receive therein confronting portions of a fence on said fence lever when the tumbler wheels are properly aligned following dialing of the proper lock opening combination, said rear wall of the lock case having an opening therein for insertion of a combination change key into the lock case and rotation thereof at as position located radially outwardly of the tumbler wheels adjacent the outer peripheries thereof, means supporting said tumbler post within the tumbler wheel hub portions for nonrotatable axial movement between first and second positions and having shoulder means forwardly and rearwardly abutting the wheel hub portions of the tumbler wheel stack for movement of the hub portions axially relative to said outer rim portions between coupled and decoupled relation therewith, rim restraint means restraining said outer rim portions against axial movement, and tumbler post positioning means within the lock case activated by rotation of the change key within the lock case between coupled and decoupled positions for axially moving the tumbler post and said tumbler wheel hub portions to shift the tumbler wheel hub portions to decoupled relation with the tumbler wheel rim portions for combination change by rotation of the hub portions to new combination positions relative to their rim portions responsive to rotation of the dial and driving cam to a new changed lock opening combination, and said tumbler post positioning means being operative to return the tumbler post and the tumbler wheel hub portions axially to positions again intercoupling the tumbler wheel hub portions and their respective rim portions responsive to rotation of the change key to coupled position.

4,796,447
LOCK WITH KEY ISOLATION USING TRANSFER TUMBLERS
Jacob Rabinow, 6920 Selkirk Dr., Bethesda, Md. 20817
Filed Jul. 9, 1987, Ser. No. 71,417
Int. Cl.[4] E05B *29/02*
U.S. Cl. 70—495 **27 Claims**



1. In a lock and key combination:
an outer member, and an inner member rotatable with reference to the outer member to open the lock,
rotatable means for receiving said key and being rotated thereby,
first and second locking means for locking said inner member to the outer one to thus prevent the lock from being unlocked,
said first locking means locking said inner and outer members together until said key has rotated said rotatable means at least a given angular amount,
said second locking means comprising a portion of said inner member movable along a diameter of its path of rotation, said second locking means locking said inner and outer members to prevent relative rotation thereof except when said portion is in one particular position in its path of motion along said diameter,
said inner member being rotatable with respect to said outer member to unlock the lock when said portion is in said particular position and said rotatable means has rotated at least said given angular amount,
said portion being positioned along said diameter by the key.

4,796,448
LOCK WITH REFERENCE PLATE
Jacob Rabinow, 6920 Selkirk Dr., Bethesda, Md. 20817
Continuation-in-part of Ser. No. 921,437, Oct. 22, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,904
Int. Cl.[4] E05B *29/02*
U.S. Cl. 70—495 **14 Claims**



1. In a lock,
locking means comprising first and second members one of which is movable with respect to the other in order to unlock the lock,
a movable third member, which when the lock is in a locked mode is in a first position wherein it blocks relative movement of said first and second members, and is movable in a predetermined direction away from said first position to a second position wherein it does not block relative movement of said first and second members,
a plurality of elongated settable elements which if set in

predetermined positions, respectively, permit said third member to be moved in said predetermined direction,

lock opening means for setting said elements in said predetermined positions, respectively,

said settable elements comprising elongated elements having free ends for engaging said third member,

means for mounting each of said settable elements at a location remote from its free end, each said settable element being movable so that its free end may be set in a selected position,

said free ends and said third member comprising means so that if any one of said free ends is not in its selected position such free end will block movement of said third member in said predetermined direction and thus prevent the lock from opening; but when all of said free ends are in their respective selected positions the third member may move in said predetermined direction with a resulting overlap between said third member and each of said free ends whereby the first and second members may have relative movement permitting the lock to open,

said third member comprising a plate having holes therein with one such hole for each said free end, each hole being positioned to receive its complementary said free end when said free ends are in said predetermined positions, respectively.

4,796,449

AUTOMATICALLY CONTROLLED MACHINE FOR ROLLING METAL SHEETS

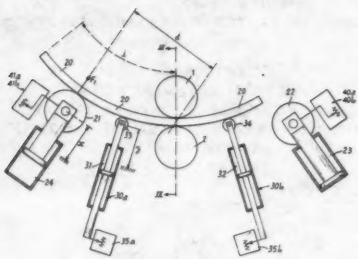
Jean G. Berne, Aix En Provence, France, assignor to Societe Nouvelle Des Ateliers Et Chantiers Du Havre, Le Havre, France

Filed Dec. 30, 1986, Ser. No. 947,719

Claims priority, application European Pat. Off., Dec. 30, 1985, 85402653

Int. Cl.[4] B21D *5/14, 7/14*

U.S. Cl. 72—9 **5 Claims**



1. An automatically controlled machine for rolling metal sheets comprising:

at least two central rollers;

means for rotating and adjustably driving said at least two central rollers with a metal sheet passing therebetween;

side rollers placed on each side of said central rollers;

positioning means for positioning said side rollers and including positioning cylinders (**23**, **24**);

a first set of sensors (**40***a*, **40***b*, **41***a*, **1***b*) connected to said side rollers and to a computer for registering a position of said side rollers;

at least two probes positioned symmetrically with respect to the central rollers and one probe disposed between said central rollers and each of said side rollers, said probe being connected to a second set of sensors and comprising a cylinder having a stem provided at a distal end thereof with a rotating wheel in contact with a metal sheet passing out of the central rollers so as to obtain a position of said probes by means of said second set of sensors;

means for rolling in a continuous manner; and

said second set of sensors being connected to said computer for providing information compared to instructions from the computer in order to correctly position the side rollers for suitably rolling the metal sheet to a required radius within given tolerances.

4,796,450

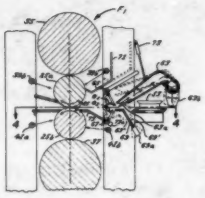
APPARATUS FOR IMPROVING HOT STRIP MILL PROCESSING

David T. Blazevic, 201 Lake Dr. - Unit 1A, Olympia Fields, Ill. 60461

Filed Sep. 22, 1986, Ser. No. 910,503

Int. Cl.[4] B21B *45/08, 27/10, 39/16*

U.S. Cl. 72—39 **27 Claims**



1. In a hot strip mill, a system for descaling an oxide layer on strips as they are delivered to a finishing mill, said system comprising:

means for supporting said strips as they leave a previous mill and move toward said finishing mill;

guide means associated with said supporting means for centering said strips as they enter said finishing mill;

a pair of cooperating work rolls comprising said finishing mill for receiving said strips from said supporting means;

said guide means being located upstream relative to the direction of motion of said strips from said pair of cooperating work rolls such that a predetermined distance separates said pair of cooperating work rolls from the closest portion of said guide means; and

a descaling means for removing an oxide layer from said strips prior to their engaging said pair of cooperating work rolls, said descaling means positioned within said predetermined distance so as to be immediately adjacent an upstream side of said pair of cooperating work rolls and downstream of said guide means, such that said strips experience a minimum buildup of a new oxide layer after descaling by said descaling means and before entry into said finishing mill, resulting in the minimization of the thickness of the oxide layer formed on the strips after they are processed by said finishing mill.

4,796,451

APPARATUS AND METHOD FOR CONTINUOUSLY FORMING EDGEWISE WOUND CORES

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780. This application Sep. 4, 1986, Ser. No. 904,140

Int. Cl.[4] B21C *47/04;* **H02K** *15/04*

U.S. Cl. 72—131 **47 Claims**

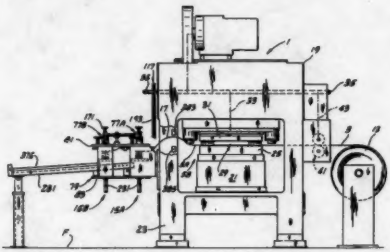
1. A method of continuously forming edgewise wound cores at a plurality of winding stations from, a strip stock of a generally thin ferromagnetic material received at an operation station, the method comprising the steps of:

operating the winding stations and the operation station conjointly from a common drive therefor;

lancing the strip stock received at the operation station in response to the driven operation thereof to divide the strip stock into a plurality of continuous strips thereof;

feeding the continuous strips intermittently from the operation station to the winding stations, respectively;

providing a looped portion in each continuous strip during the feeding step and enabling thereby continuous feeding of the continuous strips from the looped portions thereof to the winding stations, respectively;



winding continuously and simultaneously the continuous strips generally edgewise thereof at the winding stations in response to the driven operations thereof, respectively, and forming thereby a plurality of helical convolutions from the continuous strip at each winding station; and

simultaneously varying the rate at which the continuous strips are continuously and simultaneously wound at the winding stations relative to the rate at which the continuous strips are intermittently fed from the operation station, respectively.

4,796,452

SETTING DEVICE FOR ADJUSTING THE POSITION OF A ROLL

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 24, 1987, Ser. No. 29,859

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610107

Int. Cl.[4] B21B *31/32, 35/00*; B30B *3/04*

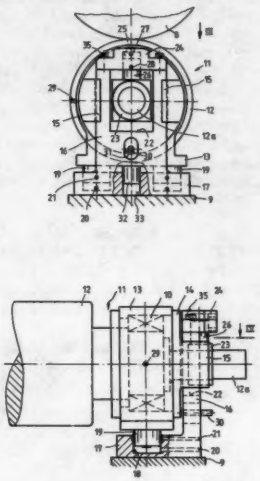
U.S. Cl. 72—245 **20 Claims**

1. A setting device for changing the position of a roll in a transverse direction with respect to a mating roll that is disposed side to side with respect to the roll, the roll having a longitudinal axis and the setting device being operable for moving the roll transverse to the roll axis in a first direction toward and in a second direction away from the mating roll, the setting device comprising:

the roll having opposite longitudinal ends and support means at the ends of the roll for supporting the roll while it rotates; a respective bearing rotatably supporting the roll on the support means ; a respective bearing housing containing the bearing at the support means at the end of the roll and adjustable with the roll;

a stationary base; actuator means supported to the base and engaging the bearing housing and supporting the bearing and being movable for moving the bearing housing and the bearing, for moving the support means for moving the roll transversely to the roll axis and with respect to the base; along the direction across the roll axis, the actuator means is at least approximately centered on the bearing;

first and second linear motion guide elements arranged at the axial outer end of the bearing housing and supported respectively to the bearing housing and to the base for guiding linear motion of the bearing housing and of the



roll with respect to the base transversely to the longitudinal axis of the roll.

4,796,453

HYDRAULIC ELEMENT AND DRAWING DIE ASSEMBLY

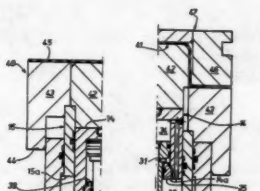
Erhardt Reitter, Sulzfeld, Fed. Rep. of Germany, assignor to Karl Hehl, Lossburg, Fed. Rep. of Germany

Filed Jun. 18, 1987, Ser. No. 63,327

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620876

Int. Cl.[4] B21D *24/02, 24/14*

U.S. Cl. 72—347 **8 Claims**



1. In a hydraulic element including a working cylinder defining a cylinder chamber having an axis and containing hydraulic medium and a working piston movable in the cylinder chamber along the axis and having an interior end arrange to communicate with the hydraulic medium in the cylinder chamber, the improvement wherein said element further comprises an annular piston movable in said cylinder chamber, along the axis, and enclosing said working piston, said annular piston having an interior end communicating with the hydraulic medium in said cylinder chamber so that movement of one of said pistons in a first direction along the axis causes the other of said pistons to move in a second direction opposite to the first

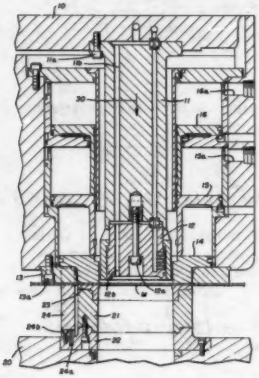
direction and wherein said working piston is a differential piston having a differential surface, said working piston has a hollow interior extending from said interior end and comprises an annular part extending radially inwardly and carrying said differential surface, and said element further comprises: a base plate supporting said working cylinder and facing said interior end of said working piston; a cylindrical extension piece secured to said base plate, extending into said hollow interior of said working piston, and being in sliding contact with said annular part; and a head member carried by said extension piece and disposed in said hollow interior such that a first portion of said hollow interior lies between said head and said annular part and forms a differential chamber for receiving hydraulic fluid which acts on said working piston in opposition to the hydraulic medium in said cylinder chamber.

4,796,454

METHOD FOR CONTROLLING MOVEMENT IN A SINGLE ACTION FORMING PRESS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Feb. 9, 1987, Ser. No. 12,625
Int. Cl.[4] B21D *22/22, 28/02*
U.S. Cl. 72—350 **4 Claims**



1. A method of forming a workpiece in a press having a movable slide and a fixed base, comprising:

(a) engaging the workpiece with a draw pad carried by the slide and urged toward the base by fluid pressure so as to hold the workpiece against a blank and draw die carried by the base;

(b) blanking the workpiece by advancing a blank cut edge carried by the movable slide past the blank and draw die;

(c) then interrupting the travel of the draw by engaging the draw pad with stop means carried by and projecting from the base only after blanking of the workpiece; and

(d) forming the workpiece by advancing a draw horn, carried by the slide, toward the base.

4,796,455

COMPACT OFFSET NOSE ASSEMBLY FOR SETTING FASTENERS

Hendrik E. Rosier, Kingston, N.Y., assignor to Huck Manufacturing Company, Irvine, Calif.

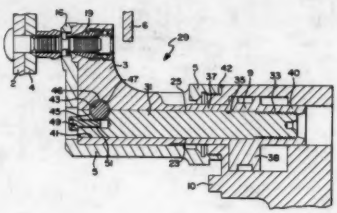
Filed Mar. 24, 1987, Ser. No. 29,935
Int. Cl.[4] B21D *31/00*
U.S. Cl. 72—391 **5 Claims**

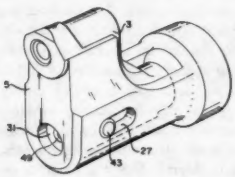
1. An offset nose assembly for swaging a lockbolt type collar about a lockbolt type fastener pin, comprising:

an anvil housing provided with a swaging anvil for swaging said collar around said pin, said swaging anvil having a central axis aligned with said pin during swaging;

a collet member mounted for axial movement within said anvil housing, said collet member adapted for receiving jaw means for gripping said pin, said collet member formed with an axially-extending smooth-walled bore having an axis radially offset from the central axis of said anvil;

a drawbar for connecting said collet member to an actuator of an installation tool, said drawbar having a substantially





smooth axially-extending surface portion closely fitted within said axially-extending smooth-walled bore of said collet member for minimizing assembly tolerances therebetween; and

a pin member rotatably mounted to said collet member, said drawbar securely connected and fixed to said collet member by said pin member for axially moving said collet member within said anvil housing so as to prevent excessive deflection of said nose assembly with respect to said pin during said swaging.

4,796,456

FORGING MACHINE

Heinz Schmoll; Peter Schubert, both of Kaarst; Hans A. Schubert, Düsseldorf; Klaus Schulze, Mönchengladbach, and Heinrich Kutz, Neuss, all of Fed. Rep. of Germany, assignors to SMS Hasenclever Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,331
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1986, 3600018; Jan. 7, 1986, 3600178; Jan. 13, 1986, 3600690; Aug. 16, 1986, 3627843; Sep. 4, 1986, 3630170; Sep. 16, 1986, 3631439
Int. Cl.[4] B21J *7/02*
U.S. Cl. 72—402 **23 Claims**

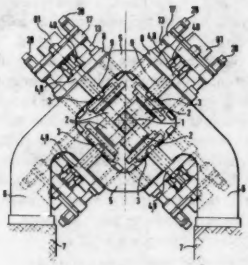
1. In a forging machine with four rams which are arranged in the form of a cross in an operating plane perpendicular to the longitudinal axis of the workpiece and are movable transversely relative to said axis along a radial ram axis and which are movable themselves as part of a piston/cylinder drive unit, and are operatively connected to tools which form a workpiece space in the stroke end position nearer the center of the cross, each tool having an unused width of its working surface overlapped by one side surface of one of the adjacent tools, and overlapping in turn with one of its side surfaces an unused

width of the working surface of the other adjacent tool, the improvement wherein:

said drive units are arranged to act radially relative to the longitudinal axis of the workpiece;

stroke setting means are provided for each of said drive units for setting and indicating the stroke end position;

a cross element is provided on each ram forming a support means adjustable transversely to the respective radial ram axis;



each tool is supported on a respective cross element for adjustment transversely to the respective radial ram axis; and

a setting device is provided operating in response to the stroke and position setting which determines the forging dimension for adjusting the tool transversely to said radial axis by an amount equal to half the difference between the total width of the tool working surface and the used width of said working surface of the tool for respective workpiece space.

4,796,457

METHOD AND APPARATUS FOR PRODUCING FLANGED BUSH

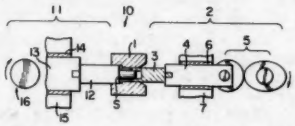
Yoshio Iijima, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

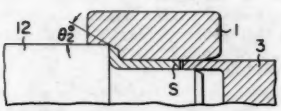
Continuation of Ser. No. 691,705, Jan. 15, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 63,716

Claims priority, application Japan, Jul. 26, 1984, 59-154124

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—370 **6 Claims**





1. A method of producing a flanged bush comprising the steps of:

providing a hollow cylindrical stock;

providing a die having a bore framed therein axially from one end to the other end thereof, said bore having a widened portion at said other end, a cylindrical portion narrower than said widened portion and of a diameter essentially equal to the outer diameter of said hollow cylindrical stock so that said hollow cylindrical stock may be inserted therein essentially without change in its outer diameter, a first annular shoulder portion having an outer diameter between that of said cylindrical portion and that of said widened portion, and a conical transition portion extending from said first annular shoulder portion to said widened portion, and a part of said bore, including a part of said conical transition portion adjacent said first annular shoulder portion, said cylindrical portion and said first annular shoulder portion, having a configuration conforming with the final shape of the flanged bush;

providing a flange-forming punch having a reduced diameter portion and a wider flange-forming second annular shoulder portion from which said reduced diameter portion axially and concentrically extends, said reduced diameter portion being of an outer diameter just smaller than the inner diameter of said hollow cylindrical stock, said second annular shoulder portion having an outer diameter just smaller than the inner diameter of said widened portion of said bore, said second annular shoulder portion and said reduced diameter portion being joined by a concave curvelinear surface;

providing a coining punch at said one end of said die;

inserting said hollow cylindrical stock into said one end of said die by means of said coining punch;

driving said reduced diameter portion of said flange-forming punch into said bore from the other end of said die while applying pressure by moving said coining punch against an adjacent first end face of said hollow cylindrical stock in opposition to the motion of said flange-forming punch until said reduced diameter portion fills the entire length of said hollow cylindrical stock, in such a manner that said curvelinear surface first contacts an inner edge of a second end face of said hollow cylindrical stock opposite said coining punch, while said second end face is positioned within said widened portion of said bore;

driving said second annular shoulder portion of said flange-forming punch against said second end face while applying pressure with said coining punch against said first end face until said hollow cylindrical stock fills said part of said conical transition portion, thus forming a flange in said part of said conical transition portion;

whereby said curvelinear surface bends said second end face radially outward, and, during said driving step, said second annular shoulder portion and said coining punch cooperate to axially compress said stock and said conical transition portion radially compresses said stock thereby plastically deforming the same.

4,796,458

FORGING MANIPULATOR

Peter Schubert, Kaarst, Fed. Rep. of Germany, assignor to SMS Hasenclever Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 86,948

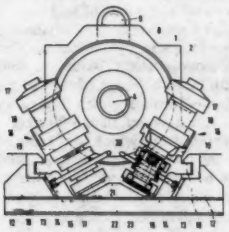
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628407; Sep. 16, 1986, 3631440; Oct. 11, 1986, 3635952

Int. Cl.[4] B21D *43/00*; B61B *13/08*

U.S. Cl. 72—420 **6 Claims**

1. In a forging machine installation, comprising a forging machine having a horizontal main axis, forging manipulator means comprising a manipulator carriage, a gripper carrier supported on the carriage and rotatable about a horizontal axis corresponding to the main axis of the forging machine, and workpiece grippers movably mounted on the gripper carrier

for gripping a workpiece; horizontal longitudinal guide means parallel to said main axis and disposed respectively on opposite sides of the manipulator carriage, the manipulator being supported by and slidable along said guide means; a respective toothed rack associated with each said guide means, disposed, in vertical cross section, at an inclination to the horizontal,



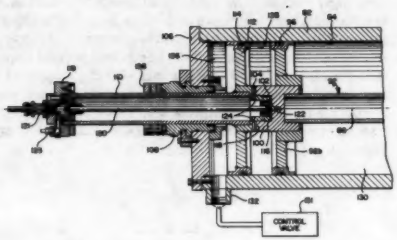
with the teeth of said racks facing upwardly and inwardly with respect to said main axis; and for each said rack a respective travel drive secured to said manipulator carriage and provided with a respective drive pinion in mesh with the associated rack, the said travel drives and pinions having respective axes disposed in a V, as seen in the direction along said main axis.

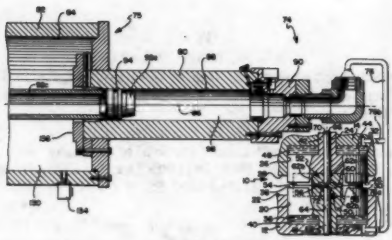
4,796,459

ACCUMULATOR SYSTEM FOR CLOSED DIE FORGING

William A. Mueller, Fairhaven, and Wolfgang Hoffmann, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1987, Ser. No. 93,888
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—354 **2 Claims**





1. In combination with a closed die forging apparatus wherein a closed die cavity is defined between a pair of dies clamped together by a fluid pressure in a variable volume oil chamber defined between at least one of said dies and an element of said forging apparatus movable through a forming stroke relative to said one die,

said oil chamber having a maximum volume at the beginning of said forming stroke and a minimum volume at the conclusion of said forming stroke,

an accumulator system comprising,

an accumulator housing,

a differential piston means having a big piston and a small piston disposed on said accumulator housing for movement between a retracted position and an extended position,

said small piston cooperating with said accumulator housing in defining a variable volume accumulator oil chamber having a minimum volume in said retracted position of said differential piston and a maximum volume in said extended position of said differential piston,

a free piston means disposed on said accumulator housing for movement between a retracted position and an extended position and cooperating with said accumulator housing in defining a variable volume high pressure gas chamber,

said free piston cooperating with said big piston and with said accumulator housing in defining a variable volume low pressure gas chamber between said free piston and said big piston,

a gaseous pressure medium in said high pressure gas chamber at an initial high pressure urging said free piston means to said retracted position,

a gaseous pressure median in said low pressure gas chamber at an initial low pressure substantially lower than said initial high pressure urging said differential piston to said retracted position, and

fluid conduit means between said variable volume oil chamber in said closed die forging apparatus and said accumulator oil chamber,

oil in said variable volume oil chamber in said closed die forging apparatus being forced into said accumulator oil chamber during said forming stroke thereby to move said differential piston from said retracted position to said extended position first against resisting gas pressure in said low pressure gas chamber increasing from said initial low pressure to a maximum at engagement of said big piston on said free piston and second against resisting gas pressure in said high pressure gas chamber as said free piston moves as a unit with said differential piston,

said resisting gas pressure achieving a maximum value at said extended positions of each of said differential piston and said free piston.

4,796,460

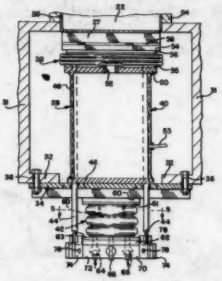
CUSHION CONSTRUCTION INCLUDING SNUBBER

Kenneth L. Smedberg, Crete; George J. Bozich, Chicago, and Robert J. Kotynski, South Holland, all of Ill., assignors to Kenneth L. Smedberg, Crete, Ill.

Continuation-in-part of Ser. No. 912,332, Sep. 26, 1986, Pat. No. 4,732,033. This application May 29, 1987, Ser. No. 55,687
Int. Cl.[4] B21D *24/02*
U.S. Cl. 72—453.13 **15 Claims**

1. A die cushion construction for use in a press, said cushion construction having a fixed plate connected to a base of the press, a resilient actuator having one end sealingly connected to the fixed plate, said actuator having an opposite end sealingly connected to a movable plate, said movable plate connected to a portion of a die in the press, the improvement comprising; a resilient snubbr actuator having one end fixed relative to the fixed plate, said snubber actuator having an opposite movable end connected to the movable plate for affecting the rate of movement of the movable plate, a plurality

of rods connecting the movable plate with the movable end of the snubber actuator, and means for allowing fluid to flow into



the snubber actuator when the movable plate of the cushion moves toward the snubber actuator.

4,796,461

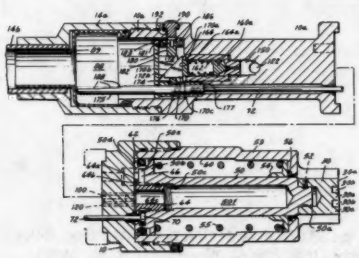
HYDRAULIC CRIMPING TOOL

Howard Mead, Loves Park, Ill., assignor to Greenlee Textron Inc., Rockford, Ill.

Filed Jun. 2, 1986, Ser. No. 869,625

Int. Cl.[4] B21J *9/12*

U.S. Cl. 72—453.16 **10 Claims**



1. A hydraulic crimping tool comprising:

a movable piston driven by a fluid for applying crimping force on an article to be crimped; and

crimping force adjusting means including a piston follower member interconnected with said piston for directly related movement whenever said piston moves, said crimping force adjusting means being adapted to sequentially and automatically reduce the force applicable by said piston in dependence on the amount of movement from a starting position of said piston.

4,796,462

WORKPIECE BITE DEVICE IN A ROLLING FLAT CUTTER

Hideo Hikuma, and Masaji Yamada, both of Hamamatsu, Japan, assignors to Fuji Tekko Co., Ltd., Shizuoka, Japan

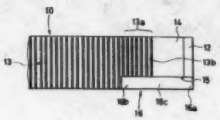
Filed Apr. 2, 1987, Ser. No. 14,531

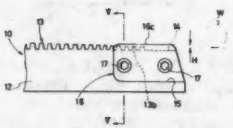
Claims priority, application Japan, Aug. 2, 1986, 61-119120[U]

Int. Cl.[4] B21H *5/00*

U.S. Cl. 72—469 **11 Claims**

1. A workpiece bite device in a rolling flat cutter comprising a cutter body having a width extending in a lateral direction and a length extending in a longitudinal direction, said cutter body having a plurality of corrugated working blades formed on a portion of a surface thereof and a charging portion extending in said longitudinal direction with said charging portion of said surface being free of said working blades, said working blades extending a height above a plane containing said charging portion, means comprising a pinch member provided at one longitudinal side of said cutter body so as not to extend across the width of said cutter body for biting a workpiece with a predetermined pinch force, said pinch member having a starting portion thereof disposed adjacent said charging portion of said surface at which a workpiece is charged into engagement with said flat cutter so that said workpiece fed into said charging portion moves simultaneously along said charging portion and starting portion of said pinch member, a terminal portion





of said pinch member being positioned adjacent a starting portion of said working blades of said cutter body such that said terminal portion of said pinch member has a longitudinal side thereof abutting a longitudinal side of said starting portion of said working blades over a predetermined distance in said longitudinal direction so that said workpiece fed within said starting portion of said working blades simultaneously moves along said terminal portion of said pinch member and said starting portion of said working blades, said pinch member having a surface thereof extending outwardly above said plane from said cutter body a distance greater than a working surface height of said starting portion of said working blades.

4,796,463

VARIABLE PERMEABILITY STEERING TORQUE SENSOR

Izrail Tsals, Princeton Junction; Ilya Feygin, Westfield, and William Marder, Pennington, all of N.J., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1987, Ser. No. 34,535

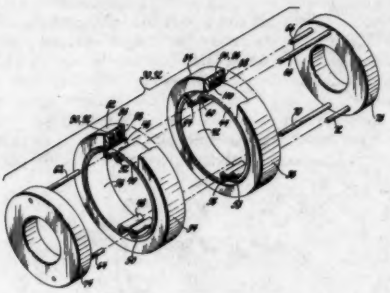
Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.33 **5 Claims**

1. A sensor responsive to the deformation of a rotary shaft to provide an indication of the torque which produced the deformation, the sensor comprising:

annular magnetic core means disposed about said shaft and supported stationary with respect thereto, primary and secondary windings disposed within a recess in the inner periphery of said core means, and magnetic deflectable means disposed within said core means to define an air gap between said deflectable means and said core means, the deflectable means being supported at longtitudinally displaced points thereof by a pair of support means which experience relative rotation in relation to the deformation of the shaft, such that the deflectable means is deflected relative to the inner periphery of the core means to vary the average dimension of said air gap in relation to the

deformation of said shaft, and the voltage induced in the secondary winding when the primary winding is excited



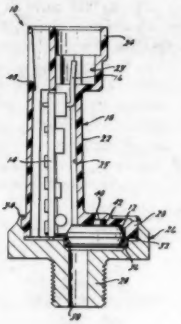
with alternating current provides an indication of the torque which produced the deformation.

4,796,464

ELECTRONIC OIL PRESSURE SENSOR DEVICE

Paul D. Miller, Huntsville, Ala., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 29, 1987, Ser. No. 114,331
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—115 **7 Claims**



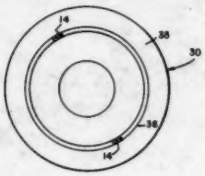
1. An electronic fluid pressure sensing device for determining the pressure of a fluid in an engine comprising:
sensor means for sensing the pressure of a fluid;
circuit means for determining the pressure of the fluid;
housing means forming a housing about said circuit means and said sensing means;
attachment means for attaching said housing means to the engine;
locating means for locating said housing means relative to said attachment means;
said attachment means comprising a base member having a threaded projection extending outwardly from said base member for threadably engaging the engine;
aperture means forming an aperture in said base member to allow fluid to enter and exit said base;
said base member including a cavity, said aperture communicating with and formed concentric to said cavity;
said locating means comprising a recess formed eccentrically within said cavity for allowing said sensing means to be disposed in said recess.

4,796,465

METHOD AND APPARATUS FOR MONITORING TURBOMACHINE MATERIAL

Diether E. Carreno, and Peter J. Morgan, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1987, Ser. No. 43,578
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **10 Claims**



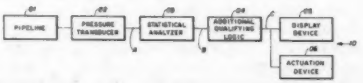
6. A turbomachine rotor wheel comprising:
the rotor wheel having opposite faces and made from a block forging;
a receptacle comprising an annular groove formed in at least one face of the rotor wheel;
at least one test specimen taken from the same block forging as the rotor wheel inserted into the annular groove whereby the test specimen may be removed and tested apart from the rotor wheel without destroying the rotor wheel.

4,796,466

SYSTEM FOR MONITORING PIPELINES

Ed Farmer, 1611 20th St., Sacramento, Calif. 95814

Filed Feb. 17, 1987, Ser. No. 15,739
Int. Cl.[4] G01M *3/00*
U.S. Cl. 73—40.5 R **24 Claims**

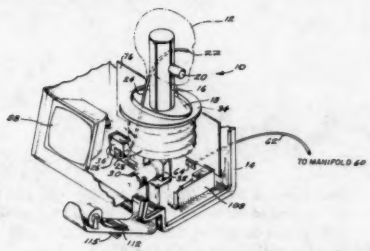


1. A system for monitoring fluid pipelines or pressure vessels to determine the probability of a break, leak or rupture therein using a procedure in which two or more different sets of pressure or velocity measurements, each of said different sets containing a different number of readings, are compared statistically to detect a trend in the readings that would be indicative of a break, leak or rupture, which system comprises:
(a) a fluid characteristic measuring means for monitoring a characteristic of a fluid in the pipeline, and which measuring means provides an output signal that is proportional to the characteristic being monitored;
(b) statistical analyzer means receiving the output signal from a measuring means and providing a statistical analysis of the data from a transducer means to determine by a statistical analysis the probability of a break, leak, or rupture in said pipeline, said probability being expressed as an output signal to a display device.

4,796,467
TESTING DEVICE FOR RESPIRATORY PROTECTIVE DEVICES

John F. Burt, Old Saybrook; Jeffrey M. Whynall, Haddam, both of Conn.; Jonathan Howe, Perry, Me.; Gilbert L. Knott, Portland, and Tavin Harnvorakiat, Rocky Hill, both of Conn., assignors to Biosystems Inc., Rockfall, Conn.

Filed Apr. 30, 1987, Ser. No. 44,915
Int. Cl.[4] G01N *19/00*
U.S. Cl. 73—168 38 Claims



1. Apparatus for testing the performance of respiratory protective devices of the type including a respiratory inlet cover comprising:

test head means, said test head means having at least a first orifice;

breathing simulator means communicating with said orifice in said test head means wherein simulated respiration is provided to said test head means;

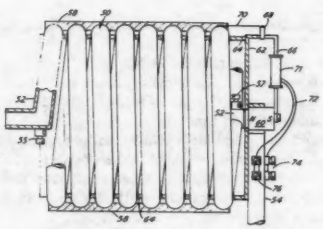
first pressure sensor means communicating with said test head means for measuring pressure surrounding said test head means; and

computer means communicating between said breathing simulator means and said first pressure sensor means.

4,796,468
APPARATUS FOR MEASURING FLUID DENSITY

Barry Blake-Coleman, and David Clarke, both of Salisbury, United Kingdom, assignors to Public Health Laboratory Service Board, England

Continuation-in-part of Ser. No. 832,713, Jan. 31, 1986, abandoned. This application Mar. 5, 1987, Ser. No. 22,213
Claims priority, application United Kingdom, Apr. 3, 1984, 8408527
Int. Cl.[4] G01N *9/00*
U.S. Cl. 73—32 A 18 Claims



1. Apparatus for use in measuring fluid density comprising:

(A) a substantially rigid base structure;

(B) a helical sample tube having a tube wall which is electrically conductive at least in a continuous portion thereof extending throughout a substantial length of the sample tube, the sample tube being fixed at end portions thereof on said base structure;

(C) sample feed means for introducing into said sample tube a body of fluid whose density is to be measured;

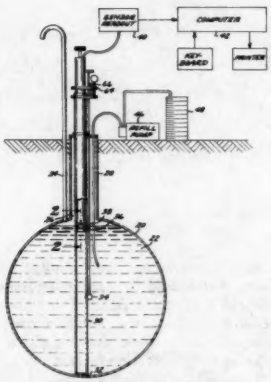
(D) drive means for the sample tube, comprising current means for passing an electrical current through said length of the sample tube and reactor means mounted on the base structure and adapted through magnetic coupling with the current carrying sample tube to excite bodily vibrational movement of the sample tube along the helical axis thereof; and

(E) monitoring means for monitoring said vibrational movement to determine the fluid density.

4,796,469
APPARATUS AND PROCESS FOR MEASURING CHANGE OF LIQUID LEVEL IN STORAGE TANKS

Robert L. Brown, Buena Park, and Roger W. Richesson, Huntington Beach, both of Calif., assignors to B-Conn, Inc., Huntington Beach, Calif.

Filed Mar. 16, 1987, Ser. No. 26,113
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—49.2 16 Claims



1. A process for measuring slow changes in the level of a liquid stored in a storage tank in an environment wherein the temperature of the liquid is prone to change during the measurement, such as measuring leakage of hydrocarbon fuel from an underground tank, the process comprising the steps of:

placing a container into the storage tank in a position where the longitudinal axis of the container is substantially vertical and wherein its bottom reaches substantially to the bottom of the storage tank, the horizontal cross-sectional area of the container being constant along the vertical axis of the container, so that the volume of liquid contained in the container is a linear function of the height of the liquid level in the container;

allowing the container to be in fluid communication with the storage tank whereby the height of the liquid level in the container is even with the liquid level in the storage tank, and measuring the height of the liquid level in the container, the measuring providing a first liquid level reading;

shutting off fluid communication between the container and the storage tank for a fixed time period which is sufficient to allow effective measurement of leakage of liquid out of the storage tank, or into the storage tank;

measuring for a second time the height of the liquid level in the container after expiration of the time period, the second measuring providing a second liquid level reading, any change between the first and second readings being due substantially exclusively to density change of the

liquid caused by change of temperature of the liquid during the fixed time period, and

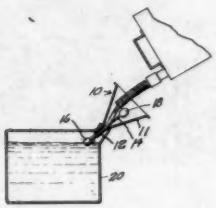
after the step of measuring for a second time, allowing fluid communication to occur again between the storage tank and the container, whereby the height of the liquid level in the container and in the storage tank equalizes, and thereafter measuring for a third time the height of the liquid level in the container, the difference in the first and second readings providing the basis for mathematically calculating the theoretical level of the liquid in the storage tank which would have been caused solely by the change in the temperature of the liquid during the fixed time period, and the difference between the calculated theoretical level and the third reading providing the basis for finding the volume of liquid which has leaked into or out of the storage tank during the fixed time period.

4,796,470

INDICATING LIQUID FUNNEL

Frank U. Labde, Rochester, Mich., assignor to The Alten Corporation, South Bend, Ind.

Filed Jun. 24, 1982, Ser. No. 391,521
Int. Cl.[4] G01F *23/30*
U.S. Cl. 73—294 **6 Claims**



1. An indicating liquid funnel comprising a tapered open ended large filling portion and an open ended reduced diameter tubular discharge portion, an indicator unit having an elongated stem portion extending through the discharge portion, a buoyant member of cross-sectional size larger than the diameter of said discharge portion carried by said stem and projecting externally from said discharge portion, and a light weight indicating portion of a size larger than said discharge portion carried by said stem and adapted to seat within the filling portion of the funnel, said stem being of a length positioning said buoyant member spaced from the end of the funnel discharge portion when said indicating portion engages the filling portion of the funnel and being of a traverse dimension not greater than one-half the inner diameter of said funnel discharge portion, said indicating portion being of a shape to permit flow of liquid therepast when engaging the filling portion of said funnel and moving visibly when said buoyant member floats toward said discharge portion during a liquid filling operation.

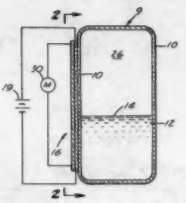
4,796,471

TECHNIQUES USEFUL IN DETERMINING LIQUID LEVELS

Cullen M. Sabin, Solana Beach, Calif., assignor to Thermonetics Corporation, San Diego, Calif.

Continuation of Ser. No. 929,498, Nov. 12, 1986, abandoned. This application May 2, 1988, Ser. No. 203,514
Int. Cl.[4] G01F *23/22*
U.S. Cl. 73—295 **3 Claims**

1. In a liquid level determining system for liquids in a storage tank that has an external surface exposed to the ambient atmosphere wherein the improvement comprises, an elongated heater producing heat uniformly along its length, an elongated thermopile having a multiplicity of hot and cold junction pairs extending uniformly along its length adjacent to and coextensively with said elongated heater, said heater being a strip electrical resistance heating element that has two flat sides, one flat side of which is mountable on said external tank surface and the other flat side of which has said elongated thermopile mounted thereon, and means mounting said thermopile on said heating element so that when said heating element is mounted on said surface a first portion of the heat produced by said



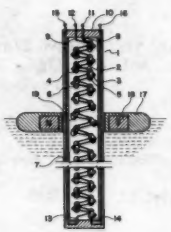
heater element flows in a first direction directly into said tank and a second portion of the heat produced by said heater flows in a second opposite direction through said thermopile in a path which extends through one of said hot junctions, then through one of said cold junctions and then into the ambient atmosphere, said heater producing insufficient heat to significantly raise the temperature of said tank.

4,796,472

LEVEL DETECTOR WITH MULTIPLE MAGNETICALLY ACTIVATED SWITCHES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 913,100, Sep. 29, 1986, Pat. No. 4,730,491. This application Jul. 10, 1987, Ser. No. 71,776
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] G01F *23/62*; H01H *35/18*
U.S. Cl. 73—308 **11 Claims**



1. An apparatus for detecting position comprising in combination :

(a) an elongated tubular container;

(b) a first elongated electrically conducting member disposed following the length of said elongated tubular container and enclosed therein;

(c) a second elongated electrically conducting member disposed following the length of said elongated tubular container and enclosed therein, wherein at least one of the first and second elongated electrically conducting members has a high specific ohmic resistance;

(d) a plurality of normally open switches disposed within said elongated tubular container at regular intervals in a parallel circuit arrangement intermediate said first and second elongated electrically conducting members, each of said plurality of normally open switches establishing electrical connection between said first and second elongated electrically conducting members when said nor-

mally open switch is closed, wherein the earth's gravitational pull acting on the normally open switches keeps the normally open switches at open position in the absence of a magnetic force field, and a magnetic force field closes the normally open switches;

(e) a marker guided by said elongated tubular container in a sliding relationship, said marker including at least one magnet creating a magnetic force field penetrating into the interior of said elongated tubular container;

(f) means for measuring ohmic resistances of two electric circuits respectively including in series one portion of said at least one elongated electrically conducting member having a high specific ohmic resistance intermediate one extremity thereof and the normally open switch closed by the magnetic force field of said marker, the normally open switch closed by the magnetic force field of said marker and a portion of the other elongated electrically conducting member, and in series the other portion of said at least one elongated electrically conducting member intermediate the normally open switch closed by the magnetic force field of said marker and the other extremity opposite to said one extremity, the normally open switch closed by the magnetic field of said marker and said a portion of the other elongated electrically conducting member; and

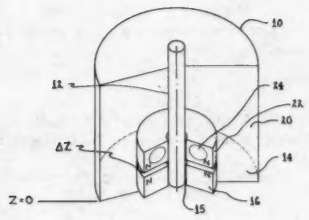
(g) means for determining the position of said marker from the measured ohmic resistances of the two electric circuits, wherein contact resistance of the normally open switch closed by the magnetic field of said marker is eliminated in arithmetics providing the position of the marker.

4,796,473

LEVEL SENSING SYSTEM

Craig S. Custer, Pompano Beach, Fla., assignor to Chem Tec Equipment Corp., Deerfield Beach, Fla.

Filed May 4, 1987, Ser. No. 45,980
Int. Cl.[4] G01F *23/12*
U.S. Cl. 73—308 **6 Claims**



1. A system for sensing the level of a body of liquid in a container, the system comprising:

(a) a shaft secured parallel to a vertical axis of said container, said shaft having therein a plurality of magnetic position responsive switches;

(b) a reference element situated circumferentially about said shaft and secured at a fixed level thereto, said reference element having a magnetic axis co-directional with the axis of said shaft; and

(c) a measuring and sensing element situated circumferentially about said shaft and vertically above said reference element but without securement thereto, said measuring element having a magnetic axis co-directional with the axis of said reference element, said axis having a polarity in repulsive relationship to said magnetic axis of said reference element, said sensing element having a negative buoyancy relative to the specific gravity of said liquid within said container,

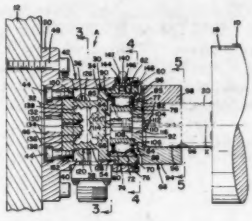
whereby said reference and sensing elements will magnetically repel each other while they are in magnetic proximity of each other, thereby causing said sensing element to float above the level of said reference element and, further whereby, the relative buoyancy of said sensing element will increase as a function of the level of said body of liquid, thereby causing the distance between said sensing and reference elements to change as a direct function of changes in the level of said body of liquid, which changes are monitored by selective magnetic actuation of said plurality of switches by said sensing element.

4,796,474

WEB TENSION TRANSDUCER APPARATUS

Robert G. Koenig, Hudson, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Sep. 2, 1987, Ser. No. 92,395
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.65 **21 Claims**



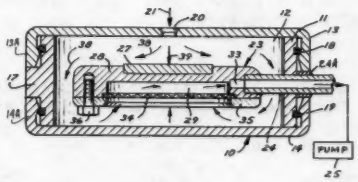
1. A transducer device for connecting one end of a shaft to a support frame, including flexure beam means cantilever supported at one end on said frame and extending in generally longitudinally centered relation with the axis of said shaft toward the said one end thereof, strain gauge means mounted on said beam means for creating a signal indicative of flexure of said beam means, a self-aligning bearing rotatively supporting said one end of said shaft on the flexurable free end of said beam means, a multiply axially split expandable cylindrical collar on one of the said free end of said beam means and the said one end of said shaft and coaxial with said shaft, said self-aligning bearing surrounding and being axially fitted onto said cylindrical collar, and a locking member forcibly inserted into the axial center passageway of said axially split collar and expanding said collar to lock it to the said bearing.

4,796,475

PERSONAL AIR SAMPLING IMPACTOR

Virgil A. Marpel, Maple Plain, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 25, 1987, Ser. No. 67,106
Int. Cl.[4] G01N *7/00, 31/00, 15/02, 1/00*
U.S. Cl. 73—863.22 **8 Claims**



1. An impactor comprising an impaction plate and filter unit including an impactor housing having oppositely facing first and second sides bounded by an outer wall, said impactor housing having an exterior surface on the first side thereof, an impaction plate mounted on said exterior surface of said impac-

tor housing, a chamber defined by a recess in said impactor housing which opens to the second side of the impactor housing and which faces in opposite direction from said impaction plate, filter means for covering said opening, means defining an air outlet from said chamber for connection to an air flow producing means for creating an air flow through said air outlet and through said opening, and outer housing means supported relative to and surrounding said impactor housing and defining a second chamber around said impactor housing, said outer housing means having an inlet nozzle opening therethrough aligned with said impaction plate so that when flow is created through said air outlet, air flows inwardly through the nozzle of the outer housing means and impinges against the impaction plate and flows around said impaction plate to reverse flow direction and flow through said filter and out through said air outlet.

4,796,476

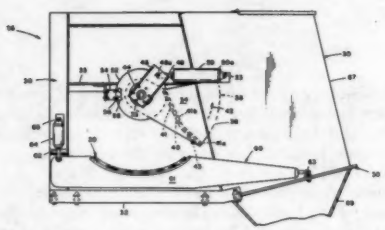
CONVEYOR BELT CROSS-STREAM SAMPLING SYSTEM AND METHOD

John B. Long, 421 Heron Hill Dr., Louisville, Tenn. 37777

Division of Ser. No. 915,746, Oct. 6, 1986, and a continuation-in-part of Ser. No. 688,394, Jan. 2, 1985, Pat. No. 4,619,149. This application Oct. 29, 1987, Ser. No. 115,883

Int. Cl.[4] G01N *1/12, 1/20*

U.S. Cl. 73—863.91 **2 Claims**



2. In a sampler which includes a sample sweep mounted for rotation about a rotative axis with a pair of cranks connected to the sweep for rotating the sweep about the rotative axis, the cranks being angularly displaced from one another and having a double acting pneumatic cylinder operatively connected to each crank, valve means for alternately pressurizing and venting chambers of each double acting pneumatic cylinder, said sweep being adapted to pass through a body of material to be sampled as the sweep is rotated, the method of controlling and rotating the sweep comprising/pressurizing a selected chamber of each cylinder to provide balancing forces to hold the sweep in a predetermined ready position, thereafter alternately pressurizing and venting selected chambers of the cylinders to provide forces to rotate the sweep through an arc which passes through the body of material to be sampled, and thereafter pressurizing selected chambers of the cylinders to return said sweep to the ready position.

4,796,477

ROTARY REVERSIBLE INDEXING MECHANISM

John H. Brems, Apt. 16-D, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Dec. 5, 1983, Ser. No. 557,467

Int. Cl.[4] F16H *37/12*

U.S. Cl. 74—52 **5 Claims**

1. An intermittent reversible indexing system having a rotary input and a rotary output, with variable kinematic characteristics comprising:

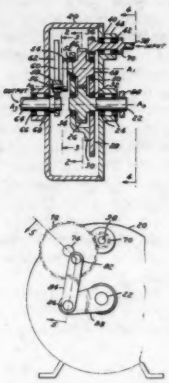
(a) a frame,

(b) a reaction gear member mounted for oscillation in said frame and concentric about a first axis,

(c) a planetary carrier member mounted for rotation in said frame and rotating about said first axis,

(d) a planetary gear member mounted for rotation in said planetary carrier member and rotating about a planetary axis displaced from said first axis and adapted for driving engagement with said reaction gear member,

(e) an eccentric shaft member mounted on said planetary gear member concentric about a third axis displaced from said planetary axis,



(f) an output member mounted in said frame and rotating about an output axis and in driven engagement with said eccentric shaft member,

(g) means for oscillating said reaction gear member, and

(h) input power means driving said planetary carrier member about said first axis and driving said means for oscillating,

whereby said planetary gear member rotates and said reaction gear member oscillates about said first axis in a predetermined relationship.

4,796,478

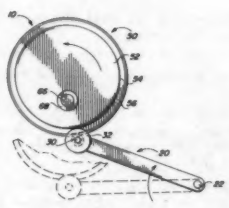
NON-LINEAR ROTARY DRIVE APPARATUS

Donald G. Carson, 12108 Towner Ave., NE., Albuquerque, N. Mex. 87112

Filed Feb. 6, 1987, Ser. No. 11,684

Int. Cl.[4] F16H *27/02, 29/02*

U.S. Cl. 74—89.2 **8 Claims**



1. Non-linear rotary drive apparatus, comprising, in combination:

first rotatable member means having a geometric center and an axis of rotation spaced apart from its geometric center for providing non linear rotational speed as the member means is rotated;

second rotatable member means disposed adjacent to the first rotatable member means;

cable means coupling the first and second rotatable member means together for joint rotary movement; and

pivoting link means for compensating for the difference between the geometric center and the axis of rotation of the first rotatable member means connected to the second rotatable member means for pivoting the second rotatable member means to maintain the second rotatable member means adjacent to the first rotatable member means as the first rotatable member means rotates on its axis of rotation.

4,796,479

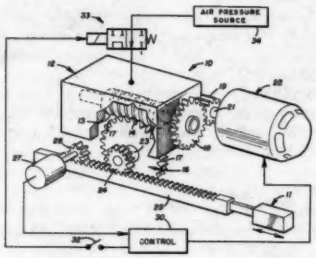
CLUTCH MECHANISM

Martin L. Wisecarver, 22032 Fallview La., Sonora, Calif. 95370

Filed Jun. 30, 1987, Ser. No. 68,111

Int. Cl.[4] F16H *35/06, 57/00*; F16D *21/04*

U.S. Cl. 74—398 **17 Claims**



1. A clutch mechanism comprising:

(a) a rotatable worm member having a thread,

(b) a driven member having teeth meshingly engageable with the thread of said worm member,

(c) mounting means mounting said worm member and said driven member for relative movement of said members towards and away from each other,

(d) spring means acting upon said worm and driven members to bias said members apart from each other,

(e) a source of air pressure,

(f) a pressure actuated device acting upon said worm and driven members to force said members towards each other with a force greater than that of said spring means when said pressure actuated device is connected to said source of air pressure,

(g) means for alternatively connecting said pressure actuated device to said source of air pressure or for venting said pressure actuated device, and

(h) driving means for rotatably driving said worm member.

4,796,480

CONSOLE MOUNTED CONTROLLER

Barry L. Amos, London; Ronald Sapelak, Belmont, and Peter Vanderweg, London, all of Canada, assignors to General Motors of Canada Limited, Oshawa, Canada

Filed Jul. 17, 1987, Ser. No. 74,995

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—483 R **11 Claims**

9. A controller for locomotives and the like, said controller comprising

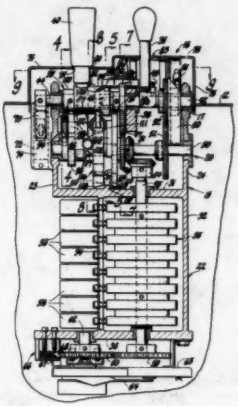
a throttle handle and a removable handle both mounted in a body for actuation by an operator,

a throttle shaft and a reverser shaft mounted in the body for oscillation about a common axis, said throttle handle being pivotally fixed to the throttle shaft for oscillation therewith into an engine idle position and various additional positions and said reverse handle being removably attached to the reverser shaft for oscillation therewith into a neutral position and forward and reverse positions, when installed,

electrical reverser switch means mounted on the body and operatively actuatable by the reverser shaft when it is oscillated into the forward and reverse positions,

an auxiliary shaft mounted for oscillation in the body on a second axis parallel with the common axis and spaced therefrom,

first drive means connecting the auxiliary shaft with the throttle shaft and causing corresponding oscillation therewith,



a switch shaft mounted for oscillation in the body on a third axis,

second drive means connecting the switch shaft with the auxiliary shaft and causing corresponding oscillation therewith,

electrical throttle switch means mounted on the body, and

throttle switch actuating means fixed to the switch shaft and engagable with the throttle switch means to actuate them when the switch shaft is oscillated into predetermined positions.

4,796,481

HEIGHT-ADJUSTABLE STEERING COLUMN FOR MOTOR VEHICLES

Frank Nolte, Osnabruck, Fed. Rep. of Germany, assignor to Lemforder Metallwaren AG, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,420

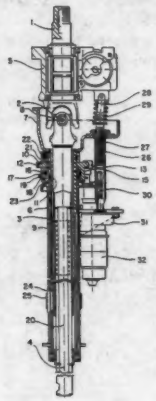
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638163

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 **9 Claims**

1. A height-adjustable steering column for a vehicle, comprising an inner steering spindle assembly of telescopic parts including an upper part having a steering wheel connecting end, an inner rotatable steering spindle part having a drive connection end and a jacket tube telescopic over said steering spindle part, a tubular housing overlying said steering spindle assembly and a drive motor coupling means carried by one of said tubular housing in said jacket tube and driveably con-

nected to the other of said housing and jacket tube for displacing said jacket tube relative to said housing for extending and



retracting said jacket tube with said steering spindle part relative to said tubular housing.

4,796,482

STEERING WHEEL

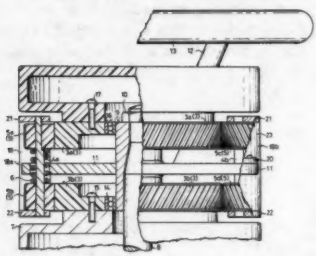
Tetsushi Hiramitsu; Satoshi Ono; Atsuo Hirano, all of Aichi, and Zenzaburo Murase, Konan, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 6, 1986, Ser. No. 871,544

Claims priority, application Japan, Jun. 10, 1985, 60-125761; Jun. 10, 1985, 60-125762; Aug. 29, 1985, 60-191612; Apr. 16, 1986, 61-58165

Int. Cl.[4] B62D *1/16*

U.S. Cl. 74—492 **5 Claims**



1. A steering wheel, comprising:
a non-rotatable column section;
a rotatable steering shaft having a longitudinal axis, said steering shaft passing axially through said column section and having an upper end portion;
a boss portion secured to the upper end portion of said steering shaft for rotation therewith;
a boss plate secured on said boss portion;
spoke means secured to and radiating outwardly from said boss plate;
a steering ring secured to said spoke means and arranged such that rotation of said steering ring effects corresponding rotation of said steering shaft;
a steering wheel pad axially superimposed upon said outer end of said upper end portion of said steering shaft;
a first sun gear of helical gear type mounted on said column section and journalled by bearing means with respect to said boss portion, so that said steering shaft, including said boss portion, may be rotated by rotation of said steering ring, about said longitudinal axis without requiring said first sun gear to rotate;
a second sun gear of helical gear type mounted on said steering wheel pad and journalled by bearing means with respect to said boss portion, so that said steering shaft, including said boss portion, may be rotated by rotation of said steering ring, about said longitudinal axis, without requiring said second sun gear and said steering wheel pad to rotate;
a plurality of planetary gear shafts arranged with respective longitudinal axes parallel to the longitudinal axis of said steering shaft; means mounting each planetary gear shaft on said boss plate; each planetary gear shaft having two opposite end portions, including one located radially beside said first planetary gear and another located radially beside said second sun gear;
a sun of planetary gear means pairs of helical gear type; each planetary gear means pair being mounted on a respective said planetary gear shaft so as to rotate therewith;
each said planetary gear means pair including:
a first planetary gear means disposed on said one end portion of the respective planetary gear shaft and in meshing engagement with said first sun gear, and
a second planetary gear means disposed on said other end portion of the respective planetary gear shaft and in meshing engagement with said second sun gear;
in at least one but less than all of said planetary gear means pairs, said first planetary gear means and said second planetary gear means being provided as separate planetary gears of helical gear type, at least one of which is mounted on the respective said planetary gear shaft by mounting means which permit the respective at least one planetary gear to move axially, to a limited extent, so that said planetary gears are relatively axially movable towards and away from one another on the respective said planetary gear shaft; and
resilient means associated with said planetary gear shaft of said one planetary gear means pair and resiliently engaging said at least one planetary gear for resiliently tending to move said at least one planetary gear axially to a limited extent for thereby taking-up play in a mechanical linkage constituted by the first planetary gear meshed with the first sun gear, the planetary gear shaft on which the first and second planetary gears are mounted, and the second planetary gear meshed with the second sun gear.

4,796,483

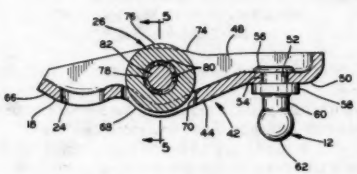
COLD-FORMED ROCKER ARM WITH CAM-CONTACTING ROLLER

Ramanlal L. Patel, Spartanburg, S.C., and Jesse V. Mills, Toledo, Ohio, assignors to The Henley Group, Inc., La Jolla, Calif.

Filed Sep. 11, 1987, Ser. No. 95,129

Int. Cl.[4] F01L *1/18*

U.S. Cl. 74—519 **9 Claims**



1. In combination, a lifter post, a valve stem spaced from said lifter post, an overhead cam, and a cold-formed rocker arm of

the cam-follower type comprising a one-piece metal body of generally U-shaped cross section throughout most of its length, said body having a bottom wall and two side walls extending upwardly therefrom and structurally integral therewith, said bottom wall having a rectangular opening at an intermediate portion thereof, said rectangular opening extending substantially the width of said bottom wall between the side walls and having a length which is less than the length of the bottom wall, said metal body having a pin with a downwardly-extending spherical portion at one end portion of said body, said spherical portion being received in an end of said lifter post on which said rocker arm can pivot, said body having a surface at a second end portion thereof with an opening extending therethrough receiving an end of said valve stem, said side walls of said body having axially-aligned openings therein above said rectangular opening, an axle extending through said aligned openings and affixed to said side walls to prevent longitudinal movement of said axle, a roller located around said axle and extending between the side walls of said body, bearing means around said axle and within a bore of said roller to enable said roller to be rotatably mounted on said axle, and a portion of a circumferential surface of said roller projecting upwardly above the upper edges of said side walls and engaging said cam.

7. A cold-formed rocker arm of the cam-follower type comprising a one-piece metal body of generally U-shaped cross section throughout its length, said body having a bottom wall and two side walls extending upwardly therefrom and structurally integral therewith, said bottom wall having a first end portion to which a pin is affixed, said pin having a rounded portion extending downwardly to receive an end of a lifter post, said bottom wall having a downwardly-facing end convex portion at a second end thereof, said bottom wall having an elongate opening at said convex portion extending longitudinally of said metal body to receive a tip portion of a valve stem, said body having an intermediate generally convex portion facing downwardly, said bottom wall having a rectangular opening therein at the convex portion, said side walls of said body having axially-aligned openings therein above said rectangular opening, an axle extending through said aligned openings and affixed to said side walls to prevent longitudinal movement of said axle, a roller located around said axle and extending substantially between the side walls of said body, bearing means around said axle and within a bore of said roller to enable said roller to be rotatably mounted on said axle, and a portion of a circumferential surface of said roller projecting upwardly above said rectangular opening to engage a cam.

4,796,484

SHAFT DETENT ASSEMBLY FOR A TIMING MECHANISM

Robert L. Eder, Speedway, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Mar. 17, 1987, Ser. No. 26,454
Int. Cl.[4] F16H *53/00*; H01H *7/08, 43/10*
U.S. Cl. 74—568 T **5 Claims**

1. A timing mechanism comprising:

a support,

a camstack having a hollow hub, said camstack rotatably mounted in said support;

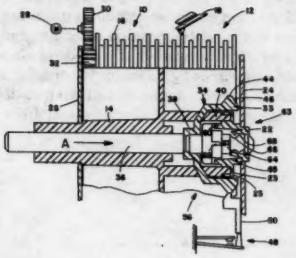
first switch means engaging said camstack to be actuated thereby;

a bearing rotatably journalled in said support;

a shaft rotatably mounted within said camstack and in said bearing and axially movable between a first position and a second position;

clutch means for engaging and disengaging said shaft and said camstack when said shaft is moved between said positions;

detent means for locating said shaft in either said first position or said second position, said detent means comprising a plurality of grooves formed in said shaft and spring fingers integrally formed with said bearing and engaging one of said grooves when said shaft is in said first portion



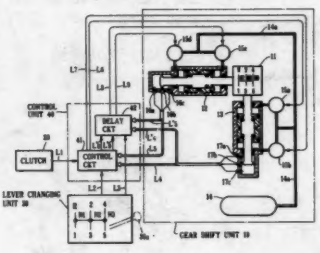
and another of said grooves when said shaft is in said second position.

4,796,485

REMOTE CONTROL APPARATUS FOR TRANSMISSION

Akimitsu Ebina, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,496
Claims priority, application Japan, Oct. 25, 1984, 59-223014
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **4 Claims**



1. A remote control apparatus for a transmission which has a selection path, a plurality of shift paths disposed parallel to each other and intersecting said selection path, neutral positions each of which is disposed at the intersections of said selection path and each of said plurality of shift paths, a shift position disposed at each end of each of said shift paths, and a striker which changes its position from one to another of said shift positions through at least one of said shift paths and at least one of said neutral positions, comprising:

means for sending a signal representing an operation state of a change lever;

auxillary power means, remote-controlled by said change lever, for changing a gear position of the transmission and sending a signal representing the gear position; and

control means for controlling an operation of said auxillary power means in accordance with the change lever operation state signal and gear position signal, said control means being provided with neutral position holding means responsive to a signal indicating that the shift path on which the striker presently exists is different from the shift path instructed by said change lever, for holding for a predetermined period the striker in the neutral position on the current shift path of said striker;

wherein said neutral position holding means comprises signal transmission delay means having: detecting means for detecting that the shift path on which said striker pres-

ently exists is different from the shift path instructed according to said change lever operating signal, then detecting that said striker has reached the first neutral position according to the neutral position signal and generating a neutral position detection signal; timer means, started in response to the neutral position detection signal, for generating an output signal when a predetermined period of time has elapsed; and gate means for opening a signal line between said control means and said auxiliary power means in response to an output signal from said timer means.

4,796,486

GEAR MECHANISM FOR FULL-TRACK VEHICLE

Bernhard Binger, Ravensburg; Hans J. Eickhoff, Tettnang; Paul Maier, Friedrichshafen; Anton Engstler, Friedrichshafen, and Herbert Grolig, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

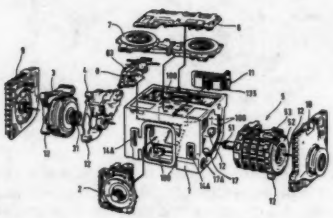
PCT No. PCT/EP85/00562, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/02892, PCT Pub. Date May 22, 1986

PCT Filed Oct. 25, 1985, Ser. No. 887,803

Claims priority, application European Pat. Off., Nov. 14, 1984, PCT/EP84/00359

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—606 R 10 Claims



1. A transmission system for full track vehicle having a transmission housing, a variable gear subassembly (5) and a steering gear subassembly (6) disposed across a longitudinal axis and a plurality of additional subassemblies (2–4 and 7–11) being interconnected to one another only by internal connections (13, 31, 51), the improvement characterized in that at least one said subassembly is aligned and fastened to the transmission housing (1) by at least two fastening elements (12), each comprising a bearing lug (121), a centering means (122) and a fastening means (123), said bearing lug receiving said centering means and said fastening means and said fastening means (123) being surrounded by said centering means (122), each of said at least two fastening elements (12) being peripherally spaced adjacent the perimeter of said at least one subassembly (3, 4, 5, 8), being aligned substantially parallel to one another, and being staggered in an axial direction of the transmission housing with respect to one another, wherein said at least two fastening elements securely fasten said at least one subassembly to the transmission housing and thereby reduce surface area of the transmission housing to be machined.

4,796,487

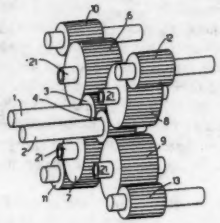
HIGH TORQUE DRIVE MEANS FOR TWO VERY CLOSE SHAFTS WHICH ARE ALSO SUBJECTED TO STRONG AXIAL THRUSTS AND APPLICATION THEREOF TO A DOUBLE SCREW EXTRUDER

Stefano De Bernardi, Busto Arsizio, Italy, assignor to Bausano & Figli S.p.A., Turin, Italy

Continuation of Ser. No. 622,828, Jun. 21, 1984, Pat. No. 4,682,510, which is a continuation-in-part of Ser. No. 599,100, Apr. 11, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,347

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—665 GA 5 Claims



1. An apparatus for rotationally driving two closely spaced extrusion shafts at the same speed and in opposite directions, comprising:

a driven gear fixedly mounted on each respective shaft;

two respective drive gears engaged with the driven gears for directly driving each said respective driven gear;

a separate drive means for driving each respective drive gear; each said respective drive means including a motor means; and

synchronizing means, secured on each respective shaft, for constraining each of said two closely spaced shafts to rotate at the same speed and in the opposite direction.

4,796,488

DIFFERENTIAL WHOSE A RING GEAR IS MOUNTED IN SOUND DAMPING MANNER ON ITS CARRIER

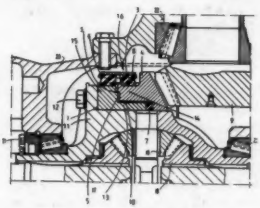
Faust Hagin, Munich; Franz Seethaler, Karlsfeld; Robert Zelinka, Munich, and Manfred Stigimaier, Gilching, all of Fed. Rep. of Germany, assignors to Man Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,506

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609034

Int. Cl.[4] F16H *1/40, 55/14*

U.S. Cl. 74—713 12 Claims



1. A drive axle comprising:

a differential case,

two differential side gears,

two differential pinions positioned for meshing engagement with said differential side gears,

a differential carrier supporting said differential pinions and said side gears,

a drive pinion having means for connection with an external drive shaft,

bearing means for supporting said carrier and said drive pinion in said case,

a ring gear in meshing engagement with said drive pinion, and

means mounting said ring gear on said carrier in sound damping manner, including,

an intermediate member rigidly connected with said carrier,

an elastic coupling connecting said ring gear to said intermediate member, and

vibration deadening material between adjacent faces of said ring gear and said intermediate member.

4,796,489

SPEED RATIO CONTROL FOR A STEP-LESSLY VARIABLE VEHICLE TRANSMISSION

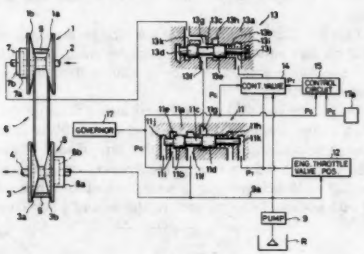
Hiroaki Nagamatsu, and Takashige Ebisumoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

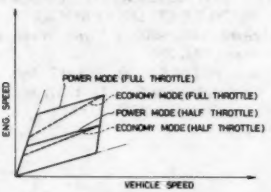
Continuation of Ser. No. 665,884, Oct. 29, 1984, abandoned. This application Apr. 27, 1987, Ser. No. 42,528

Claims priority, application Japan, Oct. 29, 1983, 58-203348

Int. Cl.[4] B60K *41/12*

U.S. Cl. 74—868 **11 Claims**





1. A steplessly variable power transmission device for motor vehicles comprising a steplessly variable transmission in which a speed ratio can be changed steplessly, hydraulic actuator means for determining the speed ratio of the transmission mechanism, valve means for controlling a supply of hydraulic pressure of said hydraulic actuator means, speed ratio control means for producing a valve control signal in accordance with vehicle operating conditions which are defined by engine load and either engine speed or vehicle speed and applying the control signal to said valve means so that the speed ratio of the transmission mechanism is controlled in accordance with the vehicle operating conditions, a plurality of modulator means for producing pressure signals of different pressures corresponding to a selected mode and throttle pressure, and manual select means for selecting one of the modulator means, said speed ratio control means including control mode changing means having at least two control modes for controlling the speed ratio in accordance with the vehicle operating conditions.

4,796,490

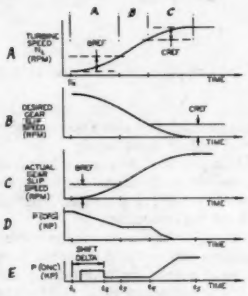
EVENT SEQUENCED CLUTCH-TO-CLUTCH DOWNSHIFT FOR AN ELECTRONICALLY CONTROLLED TRANSMISSION

Kenneth R. Butts, Grosse Pointe Woods, and Joseph L. Wanamaker, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1987, Ser. No. 136,417

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—866 **5 Claims**



1. In a motor vehicle including an engine connected to drive the vehicle through an automatic transmission, where the engine develops output torque in relation to operator demand and the transmission includes a fluid-operated torque establishing device associated with each of an upper and a lower speed ratio mechanism, which devices are selectively engageable to transmit engine torque through their respective speed ratio mechanisms, a method of operating the torque establishing devices so as to downshift the transmission from the upper speed ratio to the lower speed ratio when the downshift is needed to satisfy operator demand, said method comprising the steps of:

progressively reducing the fluid pressure supplied to the torque establishing device associated with the upper speed ratio, thereby allowing the engine to increase the transmission input speed;

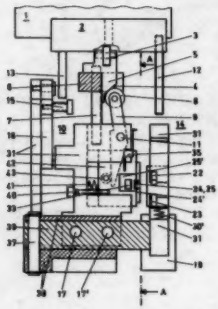
suspending the progressive reduction of the fluid pressure supplied to the torque establishing device associated with the upper speed ratio when the slippage thereacross exceeds a first reference value; and

progressively engaging and disengaging the torque establishing devices associated with the lower and upper speed ratio mechanisms, respectively, when the slippage across the torque establishing device associated with the lower speed ratio mechanism falls below a reference value chosen in relation to the time required for such engagement and disengagement, whereby the transmission input speed substantially achieves a post shift value at the time of such engagement and disengagement, resulting in reduced shift-related output torque disturbance.

4,796,491
APPARATUS FOR STRIPPING ELECTRICAL CONDUCTORS

Hans-Jurgen Klaussner, Via Lungo Lago 2-4 (XXV) 25.aprile, I-21037 Lavena/Ponte Tresa, Italy

Filed May 26, 1987, Ser. No. 53,748
Claims priority, application Switzerland, May 31, 1986, 0202/86
Int. Cl.[4] H02G 1/12
U.S. Cl. 81—9.51 7 Claims



1. Apparatus for stripping insulation from electrical conductors comprising:

a fixed casing;

a first movable machine part and a second movable machine part mounted on said fixed casing;

said first machine part including a conductor clamping unit;

said second movable machine part including a stripping unit with means for removing a desired length and depth of insulation from the conductor;

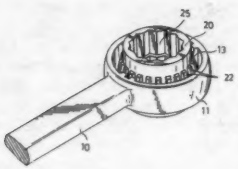
a drive unit having actuating means for actuating said conductor clamping unit and said stripping unit; and

drive transmission means for transmitting drive from the drive unit to the second movable machine part, the drive transmission means including at least one slider provided with a first cam surface, a cam follower in contact with the first cam surface, and a ram having a first roll mounted thereon and being movable to operate the slider, the cam follower being movable on the first cam surface to actuate the second movable machine part.

4,796,492
CLUTCH TYPE SOCKET WRENCH

Mou-Tang Liou, No. 33, Hsi-hu Rd., Ta-Lee Hsiang, Taichung Hsien, Taiwan

Filed May 20, 1988, Ser. No. 196,311
Int. Cl.[4] B25B 13/46
U.S. Cl. 81—58 4 Claims



1. A socket wrench comprising:

a one piece member having a cylindrical hollow head and a handle radially extending in a plane perpendicular to an axis of said hollow head, said hollow head having two opposite open ends and an inner peripheral surface, said inner peripheral surface having at least two pairs of spaced apart first teeth elongated axially and extending inward therefrom, each of said pairs of said first teeth being located at a position diametrically opposite to the other, said inner peripheral surface of said hollow head further having a first annular groove formed thereon, said first annular groove passing across each of said first teeth, each of said first teeth having a notch where said annular groove passes across and thus being separated into two first parts, each of said first parts of each of said first teeth having a gradually decreasing height from a point adjacent to said notch towards one of said open ends of said hollow head,

a torque transmitting means including a sleeve member inserted in said hollow head and having an axial length greater than that of said hollow head, said sleeve member having two opposite open ends extending out of said hollow head, said sleeve member having an outer periphery provided with a plurality of second teeth elongated axially and extending radially therefrom, said outer periphery further having a second annular groove extending around said outer periphery and passing across said second teeth, each of said second teeth having a second notch where said second annular groove passes across and thus being separated into two parts, each of said two parts of said second teeth having a gradually decreasing height from a point adjacent to said second notch towards one of said open ends of said sleeve member,

a substantially C-shaped locking ring inserted in said second annular groove and extending partially into said first annular groove, said C-shaped locking ring being restricted from moving axially relative to said sleeve member,

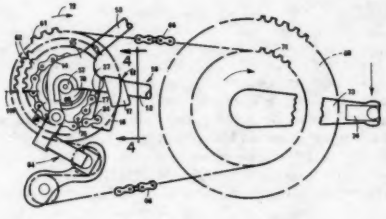
said first annular groove having a width greater than that of said second annular groove, thus permitting said hollow head to move axially in a limited amount relative to said sleeve member,

said first teeth and said second teeth being disengaged from each other when said sleeve and said hollow head are placed in a position in which the axis of said sleeve and said hollow head are in alignment, said first teeth and said second teeth being engaged with each other when the axis of said hollow head inclines to the axis of said sleeve.

4,796,493
APPARATUS AND METHOD FOR UNSCREWING A BICYCLE CHAIN SPROCKET

Richard J. Menard, 1680 Adanac Street, Vancouver, British Columbia, Canada V5L 2S5

Continuation-in-part of Ser. No. 853,857, Apr. 21, 1986, abandoned. This application Feb. 17, 1987, Ser. No. 15,687
Int. Cl.[4] B25B 13/52
U.S. Cl. 81—65.2 20 Claims



1. An apparatus for unscrewing a bicycle chain sprocket from a bicycle sprocket cluster, the apparatus having:

(a) a hook means for engaging a portion of a bicycle frame generally adjacent journalling means of the sprocket cluster, the hook means having first and second end portions and an intermediate portion, the intermediate portion being disposed between and rigidly interconnecting the

end portions so that the end portions extend away from the intermediate portion in a generally similar direction, the first end portion lying in a plane offset from the second end portion to receive a portion of the bicycle frame therebetween,

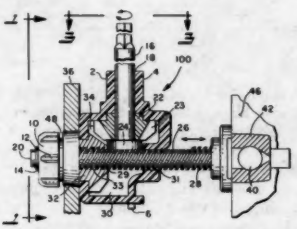
(b) a sprocket engaging means for engaging a particular sprocket to be unscrewed, the sprocket engaging means being connected to the first end portion of the hook means so as to prevent essentially rotation of the particular sprocket relative to the frame as torque is applied to the sprocket cluster.

4,796,494

HEADLIGHT POSITION ADJUSTMENT ASSEMBLY

Robert T. Eckenrode, North Canton, and Joseph J. Dillon, Jr., Canal Fulton, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 30, 1987, Ser. No. 31,636
Int. Cl.[4] B25B *33/00*
U.S. Cl. 81—484 **3 Claims**



1. A vehicular headlight position adjusting assembly comprising:

intermeshed drive and driven gears having their respective rotational axis angularly displaced from each other,

an elongate drive member drivingly connected to the drive gear and operable upon rotation to cause both the drive gear and the driven gear to rotate about their respective rotational axis

an elongate adjusting member threadingly engaged with the driven gear and having an end thereof adapted to engage a movable frame upon which the headlight is mounted,

a housing comprising first and second housing members releasably joined together and adapted to protectively enclose the drive and driven gears and having respective openings therein enabling the drive and adjusting members to extend therefrom,

means for securing the housing to a fixed frame on the vehicle so as to enable the adjusting member to move the movable frame in response to rotation of the drive member,

and means within the housing members for preventing the adjusting member from rotating whilst enabling the adjusting member to traverse in opposite axial directions in response to rotation of the drive member in opposite rotational directions, said means comprising an elongate flat on the adjusting member that is slidingly engaged with a projection from the drive gear operable to prevent the adjusting member from rotating whilst enabling the adjusting member flat to slide in opposite axial directions relative thereto.

4,796,495

MAGAZINE HAMMER

Anton Schär, Horgen, Switzerland, assignor to Hammermat AG, Zurich, Switzerland

Filed Mar. 4, 1988, Ser. No. 173,464
Claims priority, application Switzerland, Mar. 26, 1987, 842/87
Int. Cl.[4] B25G *1/00*
U.S. Cl. 81—490 **16 Claims**

1. A magazine hammer comprising:

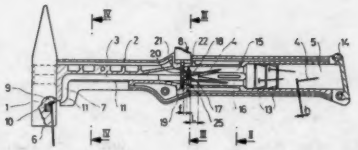
a hammer head,

a hammer shaft running substantially transversely to the hammer head,

a guide channel running substantially in the longitudinal direction of the hammer shaft and having an interior configured to guide nails towards the hammer head,

a nail magazine comprising a hollow space formed in the interior of the hammer shaft end remote from the hammer head for accommodating a plurality of nails substantially oriented in the longitudinal direction of the hammer shaft,

an apportioning device for individually delivering nails originating from the nail magazine, in their longitudinal direction, into the guide channel,



a deflection channel disposed substantially adjacent the hammer head and having an outlet end, in which the nails moved individually towards the hammer head are deflected and moved into a dispensing position, the deflection channel and the guide channel having a passage slot configured so that the nail head is prevented from passing through the passage slot and the nail shank is permitted to swing out unimpeded, and

a setting device arranged at the outlet end of the deflection channel and configured to bring each nail coming out of the deflection channel into an appropriate setting position relative to the hammer head.

4,796,496

Patent Not Issued For This Number

4,796,497

METHOD AND APPARATUS FOR CUTTING A CHAIN OF ELONGATE PRODUCTS

Toyoo Morita, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,210
Claims priority, application Japan, Dec. 25, 1985, 60-296419
Int. Cl.[4] B65H *35/06*
U.S. Cl. 83—23 **8 Claims**

1. A method of cutting a continuous chain of longitudinally joined elongate products into pieces of a desired length, the chain having longitudinally spaced successive joint portions, said method comprising the steps of:

(a) feeding the chain of elongate products intermittently by a first distance equal to the length of each piece to be severed, along a path through a detecting station and a cutting station downstream of the detecting station;

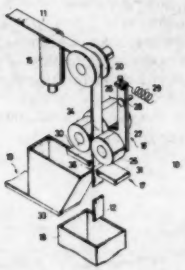
(b) cutting the chain successively into pieces of the desired length at the cutting station while the chain is at rest;

(c) during said feeding, detecting the joint portion of each adjacent pair of the elongate products at the detecting station;

(d) in response to said detecting, computing the number of prospective pieces of the desired length producible by severing from a longitudinal portion of the chain which extends from the present leading end of the chain toward

the detected joint portion and terminates short of the detected joint portion;

(e) repeating said feeding and said cutting until the computed number of pieces have been severed;



(f) thereafter, feeding the chain forwardly by a second distance until the detected joint portion is located downstream of the cutting station;

(g) cutting the chain to produce a severed a piece including the detected joint portion; and

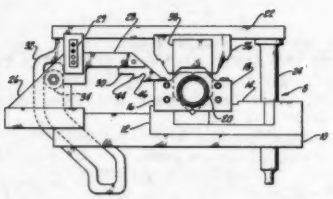
(h) removing the last-named severed piece.

4,796,498

METHOD FOR DIMPLE FREE GUILLOTINE CUTTING OF MULTIPLE WALL TUBE

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries, Inc., Novi, Mich.

Filed Feb. 24, 1987, Ser. No. 18,027
Int. Cl.[4] B26D *3/06, 3/16*
U.S. Cl. 83—49 3 Claims



1. A method for dimple free guillotine cutting of multiple wall tube comprising the steps of:

cutting a first notch laterally of the tube axis to a depth substantially equal to the thickness of the outermost tube wall;

cutting a second notch through the path of the first notch but to a greater depth, which greater depth extends partially through the innermost tube wall, the steps of cutting the first and second notches being performed in sequence during a single stroke of a notching blade relative to the tube; and

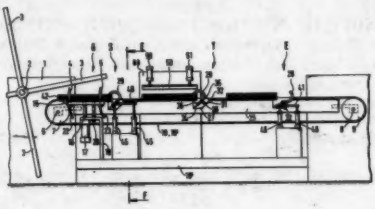
severing the tube entirely with a guillotine blade which enters the tube through the notches.

4,796,499

APPARATUS FOR STACKING AND DELIVERING FLAT ARTICLES, SUCH AS DOUBLE BAGS MADE OF PLASTIC FILM

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 33,700
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611237
Int. Cl.[4] B26D *7/10, 7/02, 5/20;* B26F *3/08*
U.S. Cl. 83—151 9 Claims



1. In an apparatus for stacking and delivering flat articles, such as double bags, which have been severed by hot wire welding from a tubular or semitubular web of plastic film and which adjacent to their center line having opening-defining edges, the articles being deposited by a transfer device at a stacking station on an endless stack conveyor means supported by a frame, the apparatus including a retaining plate disposed in the stacking station and provided with upstanding stacking pins or stacking needles for impaling the articles adjacent their longitudinal center line so as to form a stack which is to be forwarded by intermittent operation of the conveyor means, the apparatus further including a severing station downstream from the stacking station, the severing station including a knife movable vertically for severing the stack along a center line extending in the direction of travel, spring-loaded gripping means for gripping stacks which have been formed on the stack conveyor by engaging the stacks at their leading edge portion, and actuating means secured to the frame for selectively opening and closing the gripping means; the improvements

wherein the stack conveyor comprises two spaced apart parallel, revolving belts, chains or like endless elements, the retaining plate is disposed in the stacking station in tracks between the endless elements and is adapted to be raised and lowered in such a manner that the stacking pins can be lowered below a plane of travel of the endless elements,

the knife cooperates in the severing station with an abutment disposed adjacent said plane of travel between the courses of the endless elements,

the gripping means comprises pairs of opposed grippers respectively secured to inner edge portions of respective ones of the endless elements, the grippers having opposite actuator elements respectively extending between the endless elements and wherein the actuating means comprises common actuating means located between the endless elements to operate on both of the opposite actuator elements in unison.

4,796,500

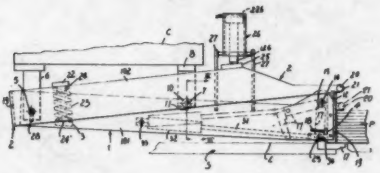
SHIFTING DEVICE

Gino Benuzzi, deceased, late of Bologna, and by Lidia Benuzzi, Heiress-at-law, 5, Via Angelo Custode, Bologna, both of Italy

Filed Apr. 2, 1986, Ser. No. 847,375
Claims priority, application Italy, Apr. 3, 1985, 15150/85[U]
Int. Cl.[4] B23Q *5/22, 5/26*
U.S. Cl. 83—277 4 Claims

1. A device for shifting packs (P) of panels along a flat

horizontal surface, said device comprising first and second levers (1, 2) hingedly mounted on a motorized carriage (C), said first, lower lever (1) being adapted to frontally contact a side of a pack (P) to be shifted by its forward end defining a vertical pushing front (13), said first lever having a lower jaw element (17) arranged so as to act on an underside of an edge of said pack (P) of panels to be shifted, said second, upper lever (2) forming, with its forward end (20, 21), an upper jaw element acting on a top side of said edge of said pack (P) of panels to be shifted, means (26) being provided for actuation of said second lever for gripping said edge of said pack between said



two jaw elements (17, 20, 21), said lower jaw element (17) being movable from an operative position in which it projects forwardly with respect to said vertical pushing front of said first lever (1), whereby said shifting device is adapted to grip said edge of said pack (P) of panels to be shifted, to an inoperative position in which it is retracted to the rear of said vertical pushing front of said first lever (1), whereby said shifting device is adapted to act as a pusher which shifts said pack (P) of panels with a skimming action with respect to the underlying flat horizontal surface, without gripping said edge of said pack itself.

4,796,501

APPARATUS FOR PUNCHING OUT A PART FROM A WORKPIECE

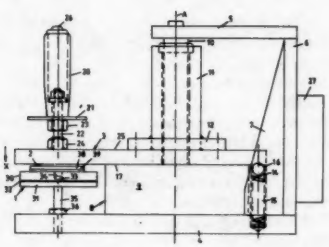
Peter Hagmann, Bohnackerweg 4, CH-2545 Selzach, Switzerland

Filed Jul. 16, 1987, Ser. No. 74,529

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624490

Int. Cl.[4] B26F *1/40*

U.S. Cl. 83—535 **9 Claims**



1. A punching apparatus for punching out a portion of a workpiece comprising a punching table, a punching plate located above said punching table, a punching pattern for punching out a portion of the workpiece, means for driving said punching plate from a rest position toward a work position when said punch plate is in a first position whereby said punch pattern punches out a portion of the workpiece and means for rotating said punching plate around a pivot axis for rotation between said first position and a second position wherein said workpiece can be located on said punching table and biasing means for returning said punch plate from said work position to said rest position wherein said biasing means presses a detent against the underside of the punching plate and said detent runs into locking trays when said punching plate is in the first position and the second position.

4,796,502

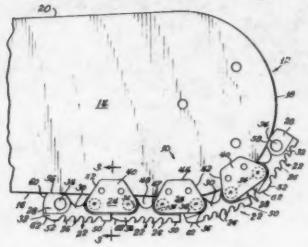
SAW BLADE STRUCTURE WITH DEPTH-CONTROL MEANS

Harvey G. Anderson, Muskegon, Mich., assignor to Pro Power Corporation, Three Rivers, Mich.

Filed Aug. 26, 1987, Ser. No. 89,580

Int. Cl.[4] B27B *17/02*

U.S. Cl. 83—834 **13 Claims**



1. A chain saw cutting link segment having a leading end and a trailing end and saw teeth forming a cutting edge therebetween with the teeth alined in a unit cutting plane and valleys between the teeth alined in a second plane parallel to said cutting plane and comprising depth-control means disposed adjacent the trailing and leading ends of said segment and between the cutting plane and the second plane, which depth-control means comprises planar surfaces disposed between and parallel to said planes, in which said planar surfaces lie in a plane parallel to said cutting plane and are spaced therefrom a distance sufficient for the teeth to bite into the material being cut but less than the normal maximum depth of penetration of said saw teeth in the absence of depth-control means, depth-control surface adjacent the leading end of said segment comprises a canted non-cutting planar surface which is normal to a longitudinal plane normal to said cutting plane and slopes to the leading end edge of said segment and which forms a corner with said leading end edge which is disposed substantially in alinement with said second plane.

4,796,503

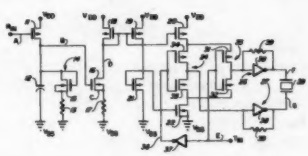
AMPLIFICATION CIRCUIT FOR ELECTRONIC TONE GENERATOR

Shyuh-Der Lin, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Jun. 15, 1987, Ser. No. 62,088

Int. Cl.[4] G10H *1/02, 1/057*

U.S. Cl. 84—1.26 **7 Claims**



1. In an electronic tone generator, first and second source follower transistors connected, respectively, to two different voltage sources, means including an RC network for producing waveform shaped currents in said follower transistors, first

and second switch means, first and second amplifiers having inputs and outputs, a piezo-buzzer connected to the outputs of said amplifiers, said first switch means being capable of alternately connecting the input of said first amplifier to said first follower transistor and to said second follower transistor, said second switch means being capable of alternately connecting the input of said second amplifier to said first follower transistor and to second follower transistor, and means for imparting a tone signal to said first and second switch means.

4,796,504

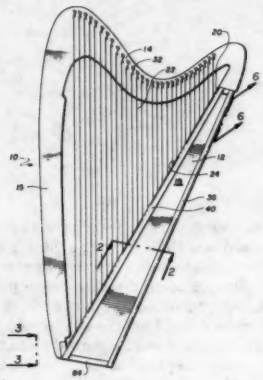
MUSICAL INSTRUMENT

Harlan McWillis, 5529 Duarte St., Los Angeles, Calif. 90058

Filed Jul. 30, 1986, Ser. No. 891,924

Int. Cl.[4] G10D *1/04*

U.S. Cl. 84—265 **20 Claims**



1. In a musical instrument having a body comprising a case having a rear side and connecting side walls having a plurality of edges defining an open front side, and a soundboard having front and rear sides provided with edges adjacent the edges of the side wall of said case closing the front side of said case, and strings stretched on said instrument so as to impart an outward force on said soundboard relative to said case, said soundboard having a front surface from which said strings extend and a rear surface facing the rear side of said case, the improvement comprising means for securing said soundboard to said case whereby all edges of said soundboard are movable by the force of said strings relative to said case.

4,796,505

TREMOLO ARM ADJUSTMENT MECHANISM IN ELECTRIC GUITAR

Toshitaka Takeuchi, 28, Azanakasandanbata, Ooazasaitou, Fusou-cho, Niwagun, Aichi-ken, Japan

Filed Nov. 20, 1987, Ser. No. 123,596

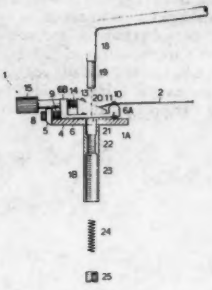
Claims priority, application Japan, Nov. 26, 1986, 61-181290[U]

Int. Cl.[4] G10D *3/00*

U.S. Cl. 84—313 **2 Claims**

1. A tremolo arm adjustment mechanism in an electric guitar comprising a body section holding a bridge saddle thereon, a block section extending downward from the body section, said body section and said block section constituting a tremolo unit, said tremolo unit having front end portion pivotally installed to the body and being rotatable in the vertical direction, and a tremolo arm mounted on the tremolo unit,

wherein said tremolo unit is provided with a mounting hole for the tremolo arm penetrating through the body section and the block section in the vertical direction, a male screw portion threaded on base portion of the tremolo arm is threadedly engaged with the mounting hole from upper side in freely traveling state, a torque adjusting screw is threadedly engaged with the mounting hole from



lower side in freely traveling state, and a spring is interposed between the torque adjusting screw and the male screw portion.

4,796,506

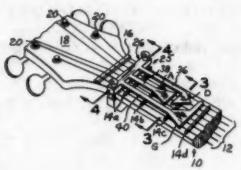
STRINGED INSTRUMENT CHORD ATTACHMENT

Gary T. Gray, P.O. Box 1593, McAlester, Okla. 74502

Filed Nov. 9, 1987, Ser. No. 117,871

Int. Cl.[4] G10D *3/04*

U.S. Cl. 84—317 **1 Claim**



1. A chord playing attachment for a musical instrument having a neck and having a plurality of strings extended longitudinally of the neck, comprising:

a unitary clamp means including a top bar having a planar top surface extending transversely of said neck and, integrally supporting a plurality of elongated planar spring members of uniform thickness projecting laterally of the top bar and extending longitudinally of the neck in string overlying cantilever juxtaposed fashion and generally parallel spaced relation,

the top surface of each spring member normally lying in the plane of the top surface of said top bar,

the terminal end portions of each said spring member extending transversely of said neck a distance at least overlying the position of at least three said strings;

a pad interposed between selected strings and said spring members and depending from the latter;

a clamp bottom bar extending transversely of said neck; and,

screw means rigidly connecting said bars and impinging the strings against said neck and supporting the spring members in superposed spaced relation with respect to said strings,

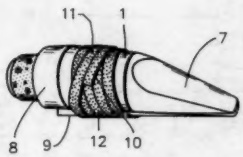
whereby pressing selected ones of said spring members toward the neck impinges the plurality of strings between the pads and the neck.

4,796,507

REED HOLDING DEVICE

Terry L. Stibal, P.O. Box 768, Belleville, Ill. 62222-0768

Filed Jan. 28, 1986, Ser. No. 823,347
Int. Cl.[4] G10D 9/02
U.S. Cl. 84—383 A 3 Claims



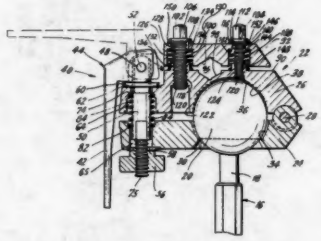
1. A holding device for a reed placed against a surface of a mouthpiece of a single-reed musical instrument, said device comprising a single unitary continuous strip material, having a base comprised of first and second surfaces, having attached to said first surface a plurality of loops made of flexible resilient material, and having attached to said second surface a plurality of hooks made of flexible resilient material, said strip material being wound around said mouthpiece and said reed in a helical fashion with said first surface placed against said mouthpiece and said reed, ends of said strip material secured in place by engaging said loops on said first surface into the surface of said hooks by winding of said strip material around said mouthpiece and said reed, said strip material exerting holding pressure against said reed.

4,796,508

MUSICAL INSTRUMENT SUPPORT FIXTURE

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Feb. 13, 1987, Ser. No. 14,603
Claims priority, application Japan, Jul. 31, 1986, 61-118581
Int. Cl.[4] G10G 5/00
U.S. Cl. 84—421 17 Claims



1. A musical instrument support, comprising:

a stem on which the support is supported, a clampable part on the stem;

a clamp for clamping the clampable part, the clamp having a first clamping part and a cooperating second clamping part which are releasably clampable around the clampable part; the clampable part and the first and second clamping parts being respectively so shaped as to enable the clamp to assume various orientations with respect to the stem upon clamping of the first and second clamping parts upon the clampable part;

an instrument holding rod arranged for being clamped to the second clamping part;

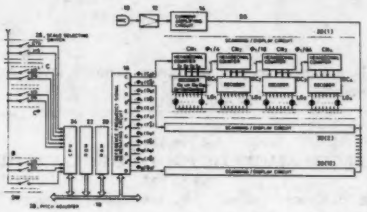
a third clamping part for clamping the holding rod to the second clamping part, and means at the third clamping part for clamping the third clamping part to the second clamping part.

4,796,509

ELECTRONIC TUNING APPARATUS

Masaaki Mizuguchi, and Hirohisa Kuroyanagi, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Filed Nov. 18, 1987, Ser. No. 122,112
Claims priority, application Japan, Nov. 22, 1986, 61-279377
Int. Cl.[4] G10G 7/02
U.S. Cl. 84—454 14 Claims



1. An electronic tuning apparatus comprising:

(a) input means for inputting a tone signal to be measured;

(b) signal generating means for generating a plurality of reference frequency signals, respectively, corresponding to a plurality of predetermined tone names independently for each tone;

(C) a plurality of groups of luminous elements, respectively, corresponding to said plurality of tone names;

(d) a plurality of display control means arranged, respectively, corresponding to said plurality of tone names; and in which

each of said display control means drives the group of luminous elements corresponding to said tone name on the basis of the reference frequency signal of the corresponding tone name from said signal generating means and the input tone signal from said input means, and an on-off arrangement pattern composed of turned-on luminous elements and turned-off luminous elements is differently displayed in the group of luminous elements corresponding to said tone name between the case of the agreement of the frequency of said input tone signal with the frequency of said tone name at a certain octave and the case of the agreement with the frequency of said tone name at another octave.

4,796,510

ROCKET EXHAUST RECIRCULATION OBTURATOR FOR MISSILE LAUNCH TUBE

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

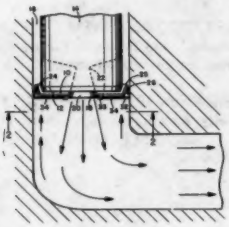
Filed Nov. 9, 1987, Ser. No. 118,674
Int. Cl.[4] F41F 3/04
U.S. Cl. 89—1.816 5 Claims

1. A rocket exhaust recirculation obturator apparatus for sealing a launch tube around an exhaust propelled vehicle, comprising:

a cover member for extending across the base of an exhaust propelled vehicle in a launch tube, the member having at least one opening for sealing around a rocket motor nozzle exit in the base of the vehicle and an outer periphery for sealing against the walls of the launch tube and being moveable up the launch tube with the vehicle under the pressure of recirculating exhaust gases; and

release means for releasing the cover member from the vehicle as the vehicle exits the launch tube and retaining

the cover member in the launch tube by linking with the cover member at least when the vehicle is leaving the



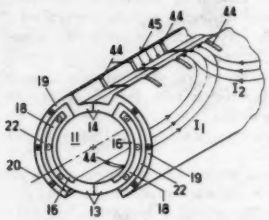
launch tube to pull the cover member away from the vehicle.

4,796,511

ELECTROMAGNETIC PROJECTILE LAUNCHING SYSTEM

Yehia M. Eyssa, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 21, 1985, Ser. No. 768,017
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **16 Claims**



1. An electromagnetic projectile launcher comprising:
(a) a pair of electrically conductive firing rails disposed generally parallel to one another to define a projectile path between them;
(b) electrical coil means formed outwardly of the firing rails for producing, when current is flowing therethrough, a magnetic field transverse to the projectile path between the firing rails;
(c) first and second supply conductors disposed outwardly of the firing rails, one of the conductors connected to one of the firing rails and the seocnd conductor connected to the other firing rail along the lengths thereof, the first and second supply conductors formed as sectors of a cylinder and disposed generally parallel to and coaxial with each other with respect to the projectial path.

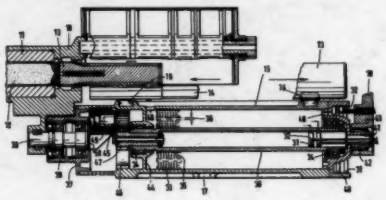
4,796,512

EXTERNALLY DRIVEN AUTOMATIC WEAPON

Richard Koine, Ratingen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 106,952
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1986, 3634815
Int. Cl.[4] F41D *7/00*
U.S. Cl. 89—11 **6 Claims**

1. In an externally driven automatic weapon including a gun barrel, a weapon housing connected to said barrel, a breechblock and cartridge supply slide mounted within said housing for linear movement along the bore axis of said barrel, a control cylinder having an outer circumferential surface provided with a camming path which is in a form-locking connection with said breechblock and cartridge supply slide, means for rotatably mounting said control cylinder within said housing so as to cause reciprocating linear movement of said breechblock and cartridge supply slide upon rotation of said control cylinder, and drive means, including an electric motor, for rotating said cylinder, with said motor being disposed within



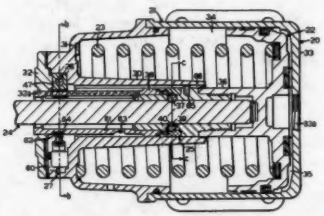
said control cylinder; the improvement wherein: a continuous shaft, which is mounted in said housing, extends axially through said control cylinder; and said motor includes a first electrical coil arranged on said shaft and a second electrical coil arranged on the inner wall of said control cylinder and radially spaced from said first coil, whereby said control cylinder itself forms part of said electric motor.

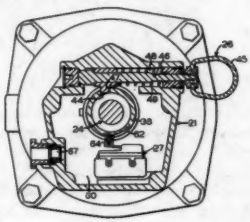
4,796,513

SPRING BRAKE CYLINDER

Yasuhisa Hata, Akashi, and Osamu Akamatsu, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 27, 1987, Ser. No. 32,103
Claims priority, application Japan, Mar. 28, 1986, 61-46433
Int. Cl.[4] F01B *25/26*
U.S. Cl. 92—5 R **5 Claims**





1. A spring brake cylinder assembly, said assembly comprising:
(a) a body portion having a pair of axially-opposed end walls;
(b) a piston positioned for reciprocal axial movement within said body portion, said piston having a face portion adjacent a first end wall of said body portion and a stem por-

tion extending in an axial direction from an inner surface of said face portion of said piston;

(c) a piston guide means engageable with said stem portion of said piston and a second end wall of said body portion for guiding said piston in an axial direction during reciprocal axial movement of said piston;

(d) a brake spring caged between said inner surface of said face portion of said piston and said second end wall of said body portion to supply a predetermined braking force to said assembly;

(e) a pushrod extending coaxially out of said second end wall of said body portion and movable in an axial direction in response to said reciprocal axial movement of said piston;

(f) a clutch means positioned for engagement with each of said stem portion of said piston and said pushrod and said piston guide means for making a connection and disconnection of said pushrod with said piston, thereby controlling their relative displacements in an axial direction;

(g) a clutch control means engageable with said clutch means and said piston guide means for controlling said clutch means between an engaged and disengaged state, said clutch control means including an elongated hollow portion surrounding said pushrod and extending out of said second end of said body portion;

(h) a clutch operating means positioned to engage said clutch control means for manually releasing said assembly from a brake application; and

(i) a sensing means positioned adjacent to and in engagement with said hollow portion of said clutch control means adjacent said second end of said body portion for indicating an operating condition of said assembly.

4,796,514

ROTARY/LINEAR CONVERTOR

Paul A. Richter, 33 Breadalbane Street, Carindale, 4152 Queensland, Australia

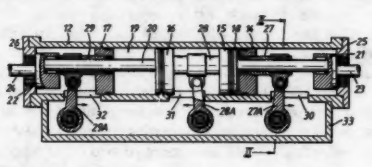
PCT No. PCT/AU86/00302, § 371 Date Jan. 29, 1987, § 102(e) Date Jan. 29, 1987, PCT Pub. No. WO87/02412, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 10, 1986, Ser. No. 87,257

Claims priority, application Australia, Oct. 11, 1985, PH2867/85; Mar. 26, 1986, PH5216/86

Int. Cl.[4] F01B *3/00, 7/10, 7/02*

U.S. Cl. 92—33 **11 Claims**



1. A rotary/linear converter comprising:

a first member having a central axis and being adapted for linear movement in the direction of said central axis;

a second member adapted for rotational movement;

connecting means operatively interconnecting said first and second members so that respective linear or rotational movement of one said member causes respective linear or rotational movement of the other said member;

characterized in that said connecting means comprises:

a connecting shaft disposed eccentrically of said central axis of said first member;

first coupling means operatively connecting said first member to said connecting shaft such that axial reciprocation of said first member causes orbital movement of said connecting shaft and vice versa; and

second coupling means operatively connecting said connecting shaft to said second member so that said orbital movement of said connecting shaft causes rotation of said second member and vice versa, wherein said first coupling means comprises a sleeve operatively connected to said first member for axial reciprocation therewith, said sleeve being associated with said connecting shaft for axial reciprocation relative thereto and at least one link member extending between said sleeve and a mounting which is in a fixed position.

4,796,515

RODLESS CYLINDER

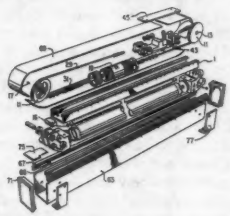
Alan G. Dry, Brantford, Canada, assignor to Ascolectric Limited, Brantford, Canada

Filed Jan. 12, 1987, Ser. No. 2,740

Claims priority, application Canada, Sep. 5, 1986, 517623

Int. Cl.[4] F01B *9/00*; F15B *15/22*

U.S. Cl. 92—137 **15 Claims**



1. A rodless cylinder, comprising:

a cylinder,

a piston within the cylinder for reciprocal movement therein,

a guide positioned outside of the cylinder and including a channel-shaped support secured to the cylinder and forming a track along free edges of flanges of the channel-shaped support,

a drive block mechanism constrained to move along the guide and including a plurality of rollers to guide the mechanism in a path which is constrained vertically and traversely with respect to the channel-shaped support,

a pulley at each end of the cylinder and guide,

a cable extending from each end of the cylinder, around one pulley and secured to each end of the drive block mechanism,

a compressible resilient member extending from each end of the piston,

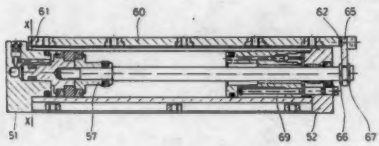
a sealing member cooperable with a valve seat located within an exit from each end of the cylinder such that when the piston approaches one end of the cylinder, the resilient member forces the sealing member into sealing contact with the valve seat so preventing egress of fluid from one end of the piston to outside of the respective end of the cylinder; and

a cover having a top, bottom, sides and ends, the top having a slot for permitting reciprocal movement of the drive block mechanism therein, an inwardly facing groove in the cover and along each side of the slot, and a belt extending below the drive block mechanism, around the pulleys and below the cylinder to completely enclose the cylinder, the guides, the drive block mechanism, the pulleys, the cable, the compressible resilient member, and the sealing member.

4,796,516
ACTUATOR PROVIDING GUIDED LINEAR DISPLACEMENT

Gábor Horváth, Budapest, Hungary, assignor to LICENCIA Talalmanyokat Ertekesito es Innovacios, Hungary

Filed Dec. 22, 1986, Ser. No. 944,752
Int. Cl.[4] F15B *15/08*
U.S. Cl. 92—165 R 17 Claims

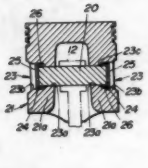


1. Apparatus providing a linear guided displacement with a predetermined maximum stroke, comprising an elongated stationary part and an elongated moving part each having respective uniform cross sections and comprising a resilient material less hard than steel, said parts defining a pair of spaced cooperating guiding channels extending linearly at respective side regions of said parts, one of said parts comprising a pair of spaced arms resiliently mounted on and extending out of a body portion of said one part, said channels of said one part being defined in internal walls of said arms and the other part being arranged between said arms, guiding bars in each of said channels abutting the channel wall and made of a material substantially harder than said one and said other parts, a linear ball bearing assembly in each of said channels guided between said bars and interconnecting said parts, said ball bearings being at least as long as half of said stroke, and biasing means pressing said channels towards each other to maintain sufficient fitting cooperation between said bars and said ball bearing assemblies and to provide for a smooth displacement during operation under load, said biasing means being formed by a biasing portion on said one part dimensioned and configured such that the spacing between said pair of spaced arms in a disassembled state is slightly less than when assembled, and the resilient flexing of said portion causing separation of said arms.

4,796,517
METAL PISTON AND CERAMIC PISTON PIN ASSEMBLY

Shigeaki Akao; Mitsuyoshi Kawamura, and Takio Kojima, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 29, 1987, Ser. No. 67,009
Claims priority, application Japan, Jul. 8, 1986, 61-104495[U]; Jul. 8, 1986, 61-104496[U]
Int. Cl.[4] F16J *1/14*
U.S. Cl. 92—187 9 Claims

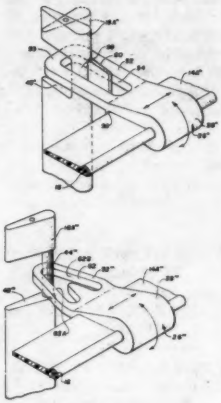


1. A piston and piston pin assembly comprising:
a piston made of metal and having piston bosses;
a connecting rod;
a piston pin connected to the rod and made of ceramics, said pin being journalled in said piston bosses and having axially opposed terminal ends;
retaining means for retaining said pins in said bosses;
intermediate ring members in abutment with said retaining means and remote from said rod interposed between said terminal ends of said ceramic piston pin and said piston bosses, said intermediate members being made of metal which is intermediate in thermal expansion coefficient between the metal forming said piston and the ceramics forming said piston pin; and
said piston having a piston head, said intermediate members being formed integral with said piston head.

4,796,518
ARTICULATED AIR VANE ARRANGEMENT

Patrick M. Murray, Waterford Township, Oakland County, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 129,190, Dec. 7, 1987, abandoned. This application May 20, 1988, Ser. No. 196,860
Int. Cl.[4] B60H *1/34*
U.S. Cl. 98—2 2 Claims



1. An articulated air vane arrangement comprising at least two vanes mounted for pivotal movement at substantially right angles relative to each other, operating means slidably mounted on and pivotal with one of said vanes for effecting pivotal movement of said one vane independent of said other vane on pivotal movement of said operating means, unidirectional linkage means including eccentric means on the other vane and arm means on said operating means operatively unidirectionally linking said operating means to said other vane for effecting pivotal movement of said other vane independent of said one vane on sliding movement of said operating means, an arm fixed on said operating means extending radially outward from the pivot axis of said one vane, said arm having an elongated slot receiving said eccentric means, and said eccentric means comprising a leverage arm fixed to said other vane and extending radially outward from the pivot axis of said other vane within said slot.

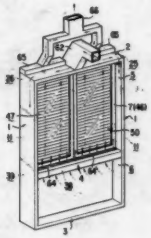
4,796,519
PREFABRICATED WINDOW UNIT WITH AIR CONDITIONING SYSTEM

Hiroshi Kondo; Toshimasa Kusunoki, both of Funabashi, and Ryo Kameda, Chiba, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,043
Claims priority, application Japan, Sep. 8, 1986, 61-136689[U]
Int. Cl.[4] E06B *7/02*
U.S. Cl. 98—97 2 Claims

1. A prefabricated window unit comprising a rectangular

framework consisting of left and right vertical members, an upper horizontal member and a lower horizontal member, a waist transom disposed between and connected to said left and right vertical members, a sealingly enclosed space delimited by indoor side and outdoor side transparent plates mounted in a windowpane frame section consisting of said left and right vertical members, said upper horizontal member and said waist transom, a blind disposed within said sealingly enclosed space indoor side hollow space portions formed in said upper horizontal member and said waist transom, respectively, so as to



open at and communicate with hollow space portions in said vertical members, outdoor side hollow space portions formed in said upper horizontal member and said waist transom, respectively, so as to open at and communicate with said sealingly enclosed space, an air feed duct connected to said indoor side hollow space portion in said upper horizontal member, an air recovery duct connected to said outdoor side hollow space portion in said upper horizontal member, a blow port for opening said indoor side hollow space portion in said waist transom to a room, and a suction port for opening said outdoor side hollow space portion in said waist transom to said room.

4,796,520

SYSTEM FOR EXHAUSTING FUMES FROM RESIDENTIAL GARAGES

Vance M. Kramer, Jr., 1913 Greendale Ave., Findlay, Ohio 45840

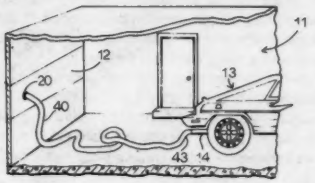
Filed Nov. 27, 1987, Ser. No. 125,883
Int. Cl.[4] F23J *11/02*
U.S. Cl. 98—115.4 **4 Claims**

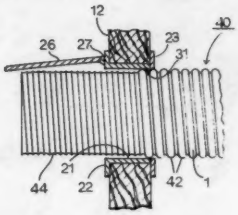
1. An apparatus for venting to outside atmosphere exhaust fumes from the exhaust pipe of an automotive vehicle located in an enclosed space with at least one outside wall portion, comprising:

means defining an aperture in the outside wall portion;

a tubular sleeve member mounted in said aperture and having a cylindrical interior surface defining a passage therethrough, said sleeve member including an exterior closure plate connected thereto for pivotal movement about a horizontal hinge axis located above the passage, between a closed position suspended over and closing the passage and an upwardly-pivoted open position, the interior surface of said sleeve having an inwardly projecting radial rib defining an arcuate portion of an internal helical thread; and

a flexible hose having a helically corrugated main length portion that defines an external helical thread, an inner end portion attachable to the exhaust pipe and an outer end portion connectable to the tubular sleeve member, said outer end portion having a cylindrical outer surface adapted to be inserted through said passage to engage and raise said closure plate and to extend therethrough sufficiently that said main length portion threadedly engages said rib when axially rotated relative thereto.



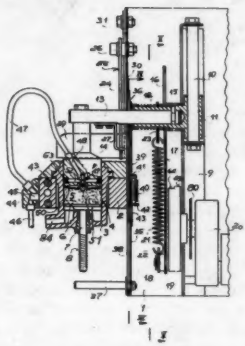


4,796,521

COMPACT AUTOMATIC COFFEE-MAKING MACHINE MORE PARTICULARLY FOR DOMESTIC USE

Lucio Grossi, Via Sylva, 30, Bergamo, Italy

Filed Oct. 22, 1987, Ser. No. 112,941
Claims priority, application Italy, Oct. 31, 1986, 22197 A/86
Int. Cl.[4] A47J *31/34*
U.S. Cl. 99—287 **15 Claims**



1. An automatic coffee-making machine, comprising:

a base;

a filter carrier formed with an internal cavity and mounted on said base;

a movable filter disposed at a lower end of said cavity for filtering a coffee infusion;

means on said base for introducing powdered coffee into said cavity;

a movable piston introducible into said cavity and forming a watertight seal therewith, said piston provided with

means for delivering into said cavity pressurized hot water supplied by a metering unit on said base;

a geared motor mounted on said base;

at least one cam disc rotatably driven by said motor;

resilient pulling means connected between said cam disc and said piston for drawing said piston into said cavity and compressing said powdered coffee;

a rod connected between said cam disc and said piston for displacing said piston out of said cavity;

guide means on said base for supporting and guiding said piston in the movement thereof, said guide means providing an irreversible transmission of the movement from said motor to said piston; and

expelling means on said base for automatically removing from said cavity said powdered coffee when spent.

4,796,522

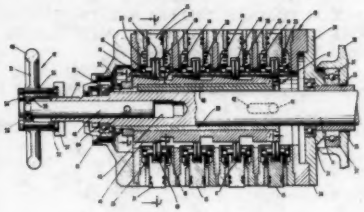
ADJUSTABLE CAM ACTUATOR

Joseph A. Lynch, Hillsdale, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Oct. 18, 1982, Ser. No. 434,784

Int. Cl.[4] A21C *9/06*

U.S. Cl. 99—450.4 **9 Claims**



1. An actuator for moving a reciprocating element through an operational cycle with provision for adjustment to change the stroke pattern of the element during one portion of the cycle independently with respect to the stroke pattern during another portion of the cycle, comprising in combination: a cam; a cam follower engaging said cam; means for connecting said cam follower to said reciprocating element to move said element in accordance with the contour of said cam, said cam having a first track for engaging said cam follower to move said element through a predetermined stroke pattern, said first track including an outer curved perimetrical surface extending parallel to a central axis, said cam also having a formation laterally adjacent to said first track and sloping from said first track at an angle with respect to said central axis, said cam having a surface including said formation providing a plurality of cam follower tracks parallel to said first track for producing various stroke patterns for said element, said cam follower including a cylindrical portion engageable with said first track and a conical portion engageable with said formation; means for moving said cam laterally with respect to said cam follower to position said follower on a selected one of said tracks; and means for moving the cam with respect to said cam follower so that said follower travels the length of said cam along said selected track.

4,796,523

INSTALLATION FOR THE CONTINUOUS HEAT TREATMENT OF FOODSTUFFS

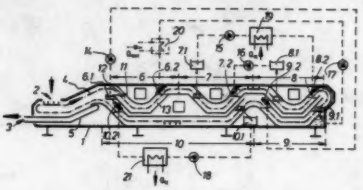
Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH + Co, Lubeck, Fed. Rep. of Germany

Filed Mar. 19, 1987, Ser. No. 27,639

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610124

Int. Cl.[4] A23L *3/00, 3/18*

U.S. Cl. 99—470 **12 Claims**



1. An installation for the continuous heat treatment of foodstuff material under atmospheric pressure for at least one of finishing and dewatering said material through contact with a liquid heat carrier, said installation comprising:

a housing having inlet and outlet means for said material to be treated and including a series of treatment zones;

endless conveyor means driven to traverse said treatment zones successively in a conveying direction for conveying said material to be treated through said treatment zones;

means for supplying and removing said heat carrier and for conveying the same within said installation;

heat exchange means for controlling an enthalpy of said heat carrier;

a series of containers arranged separately from each other and to receive said heat carrier, respectively; and

said means for supplying and removing said heat carrier including means for permitting said supplying and removing to be controlled independently between said containers for a variable exchange of said heat carrier within said installation.

4,796,524

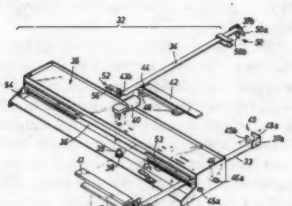
METHOD AND APPARATUS FOR WRAPPING BALES OF CROP MATERIAL

Loic Renaud, Coex, France, assignor to Hay & Forage Industries, Hesston, Kans.

Filed Sep. 24, 1986, Ser. No. 910,940

Int. Cl.[4] B65B *13/18*

U.S. Cl. 100—3 **21 Claims**



1. In a method of wrapping bales of fibrous crop materials in a pick-up bales inside which cylindrical bales (8), having longi-

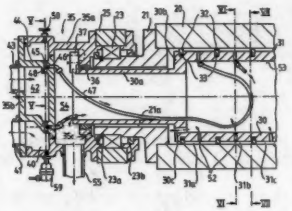
tudinal axis, a median zone, two end zones, and two longitudinal halves, are formed from windrowed fibrous crop materials (10), and of the type in which, when a bale (8) is completed, the free end of a binding twine (61) is projected onto the periphery of the bale (8) by means of a pair of twine guiding devices (33,34), the improvement comprising the steps of helically winding the twine under tension around said bale while moving the guiding devices (33,34) at constant speed in parallel to the axis of the bale (8) so as to wrap the whole cylindrical periphery of the bale with the twine, which later is cut at the end of the wrapping operation in the median zone of the bale periphery; simultaneously starting wrapping of said bale in the two end zones of the bale periphery, first on the inside (70*a*) of each end zone (69*a*, 69*b*) at sufficient distance from the edge to prevent crumbling of the bale, and then on the outside (70*b*) of said end zone; continuing wrapping by simultaneously wrapping the two halves of the bale, starting from the end zones, and then mixing the two twine-guides (33,34) and their twines (61), at constant speed, one towards the other and in parallel to the axis of the bale (8), the transversal displacement of the two twines (61) in parallel to the axis of the bale (8) being stopped when the twine-guides (33,34) have moved toward each other opposite the median zone of the bale (8); two sets (72*a*,72*b*) of several circular windings of twine being made before the twines are cut (61); and cutting said twine.

4,796,525

PRESS NIP FORMED BY A DEFLECTION-CONTROLLED ROLL IN CONJUNCTION WITH A TEMPERATURE-CONTROLLED ROLL

Christian Schiel, and Albrecht Bauder, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Division of Ser. No. 762,154, filed as PCT EP84/00376 on Nov. 29, 1984, published as WO85/02425 on Jun. 6, 1985, Pat. No. 4,639,990. This application Jul. 21, 1986, Ser. No. 899,236
This application Jul. 21, 1986, Ser. No. 899,236
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343313
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—93 RP **18 Claims**



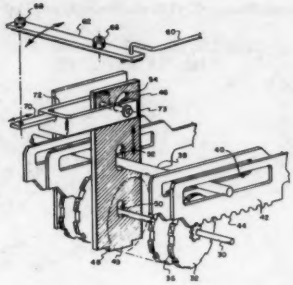
1. A roll arrangement comprising at least two press rolls which rotate against each other to form a press nip, one of the two rolls being solely a deflection-controllable roll and the other press roll being solely a zone by zone temperature-controllable roll whereby the rolls are controlled independently of one another and the temperature-controllable roll includes a rotatable tubular roll shell and a stationary core extending through the roll shell, the tubular roll shell and the stationary core each having respective first and second axial ends, means for supporting the first and second axial ends of both the roll shell and the core, a plurality of annular chambers which follow one another along the rotational axis of the roll, the annular chambers being located in an annular clearance provided between the core and the roll shell, and a means for flowing fluid through each annular chamber to control the temperature of each respective section of the roll shell which lies adjacent each annular chamber.

4,796,526

VALUE PRINTING DIE PROTECTION DEVICE IN AN ELECTRONIC POSTAGE METER MACHINE

Timothy R. Erwin, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 27, 1983, Ser. No. 508,356
Int. Cl.[4] B41L *39/04*
U.S. Cl. 101—65 **10 Claims**



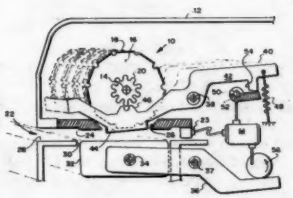
4. An obstruction mechanism for preventing fraudulent impressions from being obtained from the print wheels of a reciprocating type of postage meter machine that has postage information inputting means, print wheels that are settable in accordance with the input information, a reciprocating platen operative to be moved into contact with fonts of the print wheels selected through the inputting means, a switch for providing power to the machine, and enabling means for driving the platen into contact with the print wheels, comprising: a slug received within the print wheels and extending intermediate the print wheels and the platen when in its home position, means for moving said slug away from the home position to a non-obstructing position upon the switch being enabled and a means for returning the slug to its home position upon the switch being disabled.

4,796,527

VALUE PRINTING DIE PROTECTION MECHANISM IN A POSTAGE METER MACHINE

Timothy R. Erwin, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 15, 1983, Ser. No. 523,507
Int. Cl.[4] B41L *39/04*
U.S. Cl. 101—70 **6 Claims**



5. A method of preventing the taking of fraudulent impressions from a postage meter machine that has settable print wheels, a reciprocating platen operative to be moved into printing contact with the print wheels and a print switch for initiating a print cycle, the steps comprising: placing a blocking member in a position intermediate the print wheels and the platen, actuating the print switch, removing the blocking member from the intermediate position, locking the print wheels,

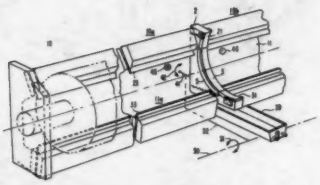
driving the platen into printing contact with the print wheels, driving the platen away from the print wheels, and returning the blocking member to the intermediate position as the platen is driven away from the print wheels.

4,796,528

SEPARATED INK FOUNTAIN FOR A FLEXOGRAPHIC PRINTING MACHINE

David J. Sarazen, Hoboken, N.J., assignor to M.A.N. Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed May 29, 1987, Ser. No. 56,785
Int. Cl.[4] B41F *31/06*
U.S. Cl. 101—208 19 Claims



1. In a flexographic printing machine,
an arrangement to separate an ink fountain (11) into different axial zones (10*a*, 10*b*) to permit use of inks of respectively different characteristics on various zones of an anilox roller (10) comprising
a separating strip element (3)
and means (21, 14*a*, 15*a*; 31, 14*b*, 15*b*; 18) for introducing a hydraulic film of a separating liquid between the surface of the strip element (3) and the surface of the anilox roller (10), including a pad element (21, 31) of a porous substance, positioned in alignment with said separating strip element (3);
liquid supply means (14*a*, 15*a*; 14*b*, 15*b*) in hydraulic fluid communication with said pad element (21, 31) of the porous substance; and
the separating strip element (3) having a curved low-friction surface fitting against and matching the surface of the anilox roller (10), positioned, with respect to the direction of rotation of the anilox roller, downstream from said pad element (21, 31), and extending over a portion of the circumference of the anilox roller,
the hydraulic film forming a ring of liquid essentially only in the circumferential region of the anilox roller which includes said portion of the circumference thereof, to float the separating strip element (3) on said ring of separating liquid.

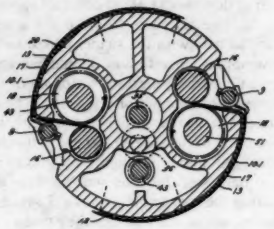
4,796,529

SHEET TURNING DEVICE FOR ROTARY PRESSES OF THE IN-LINE TYPE

Josef Mathes, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,550
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542649
Int. Cl.[4] B41F *21/10, 13/18*
U.S. Cl. 101—230 18 Claims

1. An assembly in a rotary press for turning a sheet comprising in combination:
a first impression cylinder for retaining said sheet as said sheet is printed on a first side;
a second impression cylinder for retaining said sheet as said sheet is printed on a second side;
a rotating transfer drum positioned between said first and second impression cylinders for removing said sheet from said first impression cylinder and delivering said sheet to said second impression cylinder;
means for providing a circumferential adjustable covering about the surface of said first impression cylinder which serves as a support surface for said sheet and extends circumferentially about said first impression cylinder a



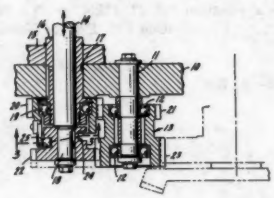
distance that is less than the circumferential extent of said sheet about said first impression cylinder such that a trailing end of said sheet extends beyond an end of said covering; and
said transfer drum including a gripper system for gripping said trailing end of said sheet.

4,796,530

OSCILLATING ROLL FOR PRINTING PRESSES

Gordon Etchell, Downers Grove, Ill., assignor to Pathfinder Graphic Associates Inc., Justice, Ill.

Filed Jun. 1, 1987, Ser. No. 56,392
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—349 3 Claims

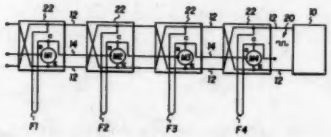


1. A distributing roller assembly for distributing printing ink or a dampening liquid on a driven roller of a printing machine comprising:
(a) a first shaft rotatably carried by said printing machine for rotatably supporting a dual geared drive member;
(b) a second shaft for the distributing roller journaled through a suitable bearing carried by said printing machine extending in a spaced parallel relation to said first shaft;
(c) a barrel cam gear adapted to be driven by said drive member and keyed to said second shaft for rotation therewith;
(d) a second driven gear mounted on said second shaft in spaced relation to said first gear and adapted to be rotated freely of said second shaft;
(e) cam means extending between said barrel cam gear and second driven gear and effective for causing said barrel cam gear and said second shaft to be reciprocally axially moved relative to said second gear and said dual drive gear;
(f) said dual geared drive member having different gear teeth ratios between it and said hub gear and said second driven gear.

4,796,531
MINING METHOD

Stafford A. Smithies, and Raymond C. Atkins, both of Pretoria, South Africa, assignors to Gernal Mining Union Corporation Limited, Johannesburg, South Africa

Filed Jul. 1, 1987, Ser. No. 69,210
Claims priority, application South Africa, Jul. 4, 1986, 86/4984
Int. Cl.[4] F42B 3/10
U.S. Cl. 102—217
7 Claims



1. A system for the electrical sequential initiation of explosions comprising:

a series of initiating modules connected to one another and connectable to a power supply;

a corresponding series of electrically actuable initiators;

each initiating module being connected to an initiator and embodying non-latching switching means for actuating the initiator associated with that initiating module;

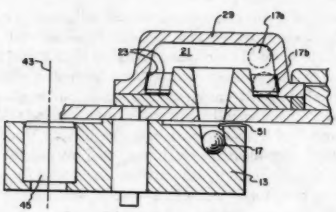
the non-latching switching means comprising a solid state electronic device having an emitter, a gate and a collector, the device comprising a short circuit between the gate and the emitter for holding the device in an "off" state to a voltage applied to the collector and an open circuit between the gate and the emitter for turning the device "on" to a voltage applied to the collector, whilst a diode integrated on the device blocks a reverse applied voltage;

the switching means of each initiating module save the first in the series being connected to the initiator associated with the preceding initiating module in the series, the arrangement being such that in operation of the system the switching means of each initiating module are disabled until the initiator associated with the preceding initiating module in the series has been actuated by that initiating module, the initiating modules in the series being actuable sequentially by the power supply so as sequentially to initiate the series of initiators.

4,796,532
SAFE AND ARM DEVICE FOR SPINNING MUNITIONS

George Webb, Larwill, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Nov. 12, 1987, Ser. No. 119,801
Int. Cl.[4] F42C 15/04, 15/26
U.S. Cl. 102—233
7 Claims



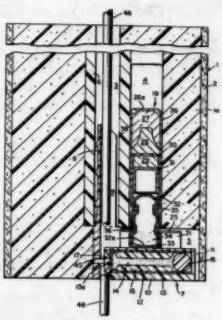
1. In a safe and arm mechanism for an explosive projectile of the type subjected to both axial and angular acceleration when discharged from a rifled barrel, the mechanism including a detonating device, an escapement mechanism for delayed arming, and a primary safety lock which precludes escapement mechanism operation until the projectile is discharged, the improvement comprising:

a void sensing mechanism for sensing deceleration caused by the projectile striking a target followed by a significant reduction of that deceleration for enabling the detonating device including a ball movable generally in the axial direction from a first position to a second position in response to the deceleration and subsequently movable from the second position to a third position in response to the reduction in deceleration.

4,796,533
PRIMER ASSEMBLY

Malak E. Yunan, Morris County, Boonton Township, N.J., assignor to ETI Explosives Technologies International Inc., Wilmington, Del.

Division of Ser. No. 714,505, Mar. 25, 1985, Pat. No. 4,718,345, which is a continuation-in-part of Ser. No. 616,138, Jun. 1, 1984, abandoned. This application May 6, 1987, Ser. No. 46,559
Int. Cl.[4] C06C 5/04; F42B 3/10
U.S. Cl. 102—322
34 Claims



16. An explosive primer comprising a substantially cylindrical mass of explosive having

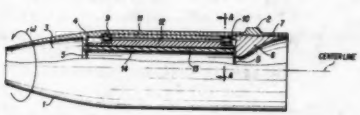
(a) a cord-receiving perforation and a detonator-receiving cavity substantially on or parallel to its longitudinal axis, said perforation and cavity being spaced apart from one another, and said perforation extending substantially from one end of said cylindrical mass to the other; and

(b) a block-like cavity for receiving a connecting block adjacent said cord-receiving perforation and said detonator-receiving cavity.

4,796,534
SPINNING RAMJET VEHICLE WITH A NON-SPINNING COMBUSTOR

Ameer G. Mikhail, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1988, Ser. No. 146,914
Int. Cl.[4] F42B 15/00
U.S. Cl. 102—374
8 Claims



1. A rotating ramjet propelled vehicle comprising:

a generally cylindrical outer shell body that rotates about a

longitudinal axis, said outer shell body having forward and rearward ends;

means, within and at the forward end of said outer shell body, for receiving intake air;

means, within said outer shell body and positioned between said forward and rearward ends of said outer shell body, for providing combustion with said intake air thereby providing propulsion gases;

means, separating said combustion means from said outer shell body, for rotatably mounting said combustion means within said outer shell body to allow said combustion means to rotate about the longitudinal axis at a slower rate than said outer shell body; and

means, within and at the rearward end of said outer shell body for expelling the propulsion gases generated by the combustion means.

4,796,535

ADAPTER CARTRIDGE FOR INSERTION TUBE SYSTEMS

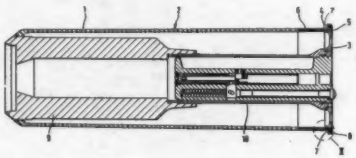
Roland Bertiller, Schramberg, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 62,450

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620697

Int. Cl.[4] F42B *5/02, 8/00*

U.S. Cl. 102—446 **9 Claims**



1. An adapter cartridge for insertion tube systems, comprising a cartridge chamber; a firing pin sleeve secured to said chamber and following said chamber in an axially rearward direction; a circular, metal, cartridge base joined to the sleeve to extend transversely thereof and a cylindrical jacket casing made of fiber-reinforced plastic, securely joined to said base and extending over the cartridge chamber, said cartridge base having an encircling drawn shell rim with opposite forward and rearward faces joined by the circumferential face; and, a shock absorbing plastic ring securely enclosing the rearward and circumferential faces only so that the forward face of the rim is exposed.

4,796,536

CHAFF DISPENSER SYSTEM

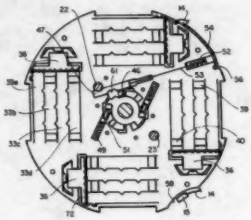
Edward K. Yu, Newark, Calif., and David W. Rogers, Spokane, Wash., assignors to Acurex Corporation, Mountain View, Calif.

Filed Jun. 23, 1987, Ser. No. 65,509

Int. Cl.[4] F42B *13/00*

U.S. Cl. 102—505 **7 Claims**

1. A chaff deployment system including a platelet, a plurality of compartments formed in said platelet, said compartments each including a bottom defined by a plurality of preformed tang springs and a top formed by a door whereby upon release of the door followed by release of the tang springs, chaff



contained in the compartments is propelled out of the compartment with predetermined direction and velocity.

4,796,537

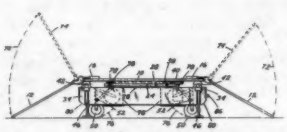
MOBILE TRUCK TURNTABLE

Robert G. Besser, 3115 Aloha La., Chico, Calif. 95926

Filed Nov. 23, 1987, Ser. No. 124,295

Int. Cl.[4] B65G *67/04*

U.S. Cl. 104—37 **5 Claims**



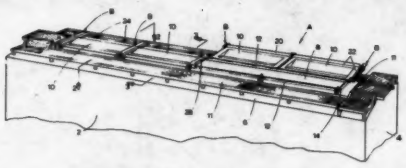
1. A mobile truck turntable comprising a substantially rectangular, scow-like turntable platform affixed upwardly on a top surface with carrier ramps and having drive-up loading ramps hingedly attached at both ends thereof; said turntable platform provided with mechanical means for redirecting a vehicle positioned on said carrier ramps; said turntable platform having vertical side walls and a bottom surface curved upwardly at two short walled terminal ends producing a slidable scow-like structure; said bottom surface affixed with slide plates and at least four retractable wheels positioned in wells in said bottom surface; there being mechanical means included therein for raising and lowering said wheels; there being street tires on said wheels; the arrangement of said retractable wheels with said street tires providing towable mobility for said turntable platform with two of said wheels adjacent two tow bar brackets affixed in the vertical surface of one said terminal end; said slidable scow-like structure being for sliding said turntable platform to use position with wheels retracted; there being mechanical means for raising and lowering said loading ramps; there being mechanically adjustable supports for said carrier ramps and ram activated stabilizers adjustably fitted at four corners of said turntable platform; said turntable platform having interconnected hydraulic lines as required for operating said rams turntable mechanical means; said interconnected hydraulic lines terminating at a hydraulic line junction box in a vertical side wall of said turntable platform with pressurized hydraulic fluid supplied through said junction box by hydraulic lines removably connected thereto; said hydraulic lines supplying pressurized hydraulic fluid from a trailer equipped with controls, gauges, pressure tank, pump and a gasoline or diesel engine as a power supply.

4,796,538

HOLD DOWN BAR FOR RAIL CAR HATCH COVERS

Ralph M. McLean, Jr., 1525 Hampton Hall Dr., Chesterfield, Mo. 63017, and James C. Bates, 2247 N. Geyer Rd., St. Louis, Mo. 63131

Filed May 1, 1987, Ser. No. 44,474
Int. Cl.[4] B61D *39/00*
U.S. Cl. 105—377 24 Claims



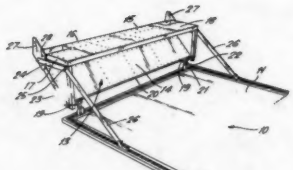
1. In combination with a car roof having a hatch in it and at least two covers which are capable of fitting over the hatch with their ends adjacent such that a slight gap exists between the adjacent ends, an improved hold down bar for securing the covers to the roof at their adjacent ends and for further closing the gap between such covers so that the gap will not admit contaminants, said hold down bar comprising: a latch arm which at one end is pivotally connected to the roof on one side of the hatch and at its other end is adapted to be fastened to the roof on the other side of the hatch, the latch arm being formed from a resilient material and being substantially flat in cross-section intermediate its ends so that it is capable of flexing easily intermediate its ends; a shoe attached to the latch arm and being formed from a resilient material which enables it to flex with the arm; and gasket attached to the shoe and being configured to generally conform to the upper surface of the hatch covers at the adjacent ends of those hatch covers, the latch arm being configured such that it flexes easily against the natural resiliency of the material from which it is formed and undergoes a perceptible change in shape as its other end is brought down toward and fastened to the roof with the shoe and gasket interposed between the arm and the covers.

4,796,539

EXTENDERS FOR AIRCRAFT PALLETS

Thomas R. Berrett, Wallingford, United Kingdom, assignor to Brownline (U.K.) Limited, Hounslow, United Kingdom

Filed Feb. 9, 1987, Ser. No. 12,695
Claims priority, application United Kingdom, Feb. 7, 1986, 8603057; May 6, 1986, 8610950
Int. Cl.[4] B65D *19/44*
U.S. Cl. 108—55.1 19 Claims



1. A pallet extender for mounting at an end of an aircraft cargo pallet comprising a first elongate load support panel, first means along one elongate edge of the first panel for mounting the first panel along an end of a pallet and for pivoting the first panel about an axis extending along said edge of the first panel, a second elongate panel extending along another elongate edge of the first panel and connected thereto by second means for pivoting the second panel with respect to the first panel, locking means acting between the first and second panels for locking the second panel in any one of a plurality of different positions with respect to the first panel, a support structure at each end of said first panel including a leg member having one end thereof pivotally engaged to said first means and the other end thereof connected to one end of a strut, said strut having the other end thereof connected to said first panel, and brace means connected to the support structures and adapted for connection to the pallet for supporting the panels in selectively different positions with respect to the pallet, said support structures being adapted to support the second panel in a substantially horizontal position when the first panel extends upwardly and outwardly from the end of the pallet supported by said brace means.

4,796,540

ROLL CRADLE PALLET AND METHOD FOR FABRICATING THE SAME

Steven D. Pelfrey, Warren, Mich., assignor to Cadillac Products, Inc., Sterling Heights, Mich.

Filed Jan. 11, 1988, Ser. No. 142,822
Int. Cl.[4] B65D *19/44*
U.S. Cl. 108—55.3 23 Claims

1. A roll cradle pallet for supporting objects comprising; a first member having an arcuate support portion to support an object, and a second member for engaging a support surface and including protrusion means extending outwardly from said second member for engaging and supporting said arcuate support portion of said first member, said protrusion means including a curved surface complementary circumferentially to said arcuate support portion of said first member to nest and support said arcuate support portion of said first member upon said protrusion means of said second member to form an integrated pallet.

4,796,541

STORAGE RACK

Robert T. Halstrick, c/o Scotland Rack Ltd., Willow Grove, Pa. 19090

Filed Jul. 31, 1987, Ser. No. 80,741
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—111 3 Claims

1. A storage rack which comprises

a plurality of upright posts of U-shape in cross section each with an outside wall and with side walls perpendicular to said outside wall,

said outside walls each having a plurality of truncated cone-shaped openings at spaced vertical locations therealong,

said side walls each having a plurality of inverted h-shaped openings at spaced vertical locations therealong, said inverted h-shaped openings being at an angle with respect to said outside wall,

said side walls each having a plurality of elongated slot openings at spaced vertical locations therealong between said inverted h-shaped openings and at an angle with respect to said outside wall,

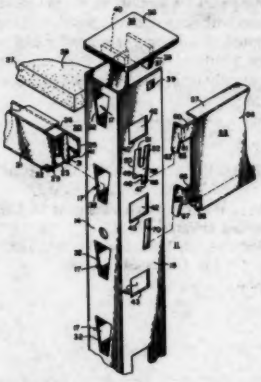
connecting members for fastening pairs of posts together to form a rack end,

said connecting members each have pairs of extensions and angled wedging tongues at each end for insertion into said inverted h-shaped openings and said elongated slot openings of said posts for connection and retention of posts thereto,

said post side walls having a plurality of square shaped vertically spaced openings at spaced locations therealong,

shelf support members for supporting loads and for connection of pairs of said rack ends together to form a rack,

said shelf support members having at least one angled wedging tongue at each end thereof for insertion into said



truncated openings of said outside walls for connection, and at least one projection at each end for insertion into one of said square shaped openings in said post side wall for retention and load transfer to said post, and

a plurality of load bearing shelves engaged with said shelf support members.

4,796,542

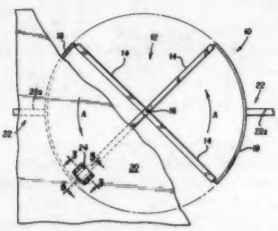
SECURITY LOCK FOR REVOLVING DOOR

Choong G. Lee, 510F Keawe St., Honolulu, Hi. 96813

Filed Jun. 17, 1987, Ser. No. 63,261

Int. Cl.[4] E05G *3/00*

U.S. Cl. 109—8 **22 Claims**



1. A lock for a door comprising:

(a) an actuator movable in a first direction into the path of the door for contact by the door, said actuator movable by a selectively-activatable means;

(b) a locking element movable into a first, door-arresting position whereat said locking element contacts the door to prevent movement of the door, said locking element being urged into said first position by a biasing member; and

(c) a latching member coupled to said actuator and cooperating with said locking element to releaseably restrain said locking element in a second position whereat the locking element is separated from engagement with the door, said latching member and said actuator movable in a second direction to release the locking element for movement into said first position.

4,796,543

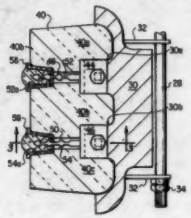
CLOSURE ASSEMBLY FOR A FURNACE

James D. Barkley, Bethlehem, Pa., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Apr. 22, 1987, Ser. No. 41,161

Int. Cl.[4] F23M *7/00*

U.S. Cl. 110—173 R **2 Claims**



1. A closure assembly for an access opening in a furnace wall, said assembly comprising a door shell; means for pivoting said door shell to said furnace wall; at least one shoulder formed on said shell; a clip angle having one leg portion extending over a face of said shoulder; bolt means extending through said one leg portion and said shoulder for securing said clip angle to said shoulder; an anchor member secured to another leg portion of said clip angle; a plug member having a portion extending in said shell, a recessed portion for receiving said shoulder, and a portion adapted to extend in said access opening when said door is closed; at least one opening extending through said plug member for receiving said anchor member; a cup extending in said opening and adapted to receive a corresponding anchor member; and a castable material extending in said cup and over said anchor member to secure said plug member to said shell.

4,796,544

APPARATUS FOR TEARING UP AND STOKING BALES OF STRAW MATERIAL AND FOR STOKING OTHER KINDS OF SOLID FUEL

Arvid Overgaard, Industivej, Denmark, assignor to Norfab A/S, Mariager, Denmark

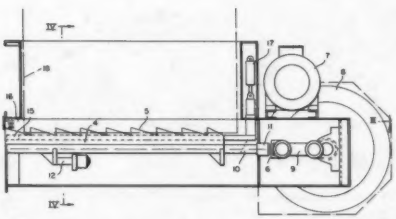
PCT No. PCT/DK86/00008, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04404, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 17, 1986, Ser. No. 918,999

Claims priority, application Denmark, Jan. 17, 1985, 0206/85

Int. Cl.[4] F23B *1/28*

U.S. Cl. 110—196 **18 Claims**



1. An apparatus for comminuting and stoking of straw bales, and for automatic stoking of chips, pieces of wood, paper, industrial waste, garbage, lignite, coal briquettes, pellets, and similar solid fuel comprising:

a number of substantially parallel reciprocating or eccentri-

cally moved serrated rods situated in connection with a feeding opening of a furnace, said serrated rods being operatively positioned for comminuting fuel and for tearing any retaining material utilized to contain the fuel;

means for feeding fuel onto the serrated rods;

a grate situated between the serrated rods, said grate being vertically movable in relation to the serrated rods, preferably by being hinged in the end that is closest to the feeding opening; and

means for conveying fuel into the furnace.

4,796,545

APPARATUS FOR TREATING COMBUSTION EXHAUST GAS

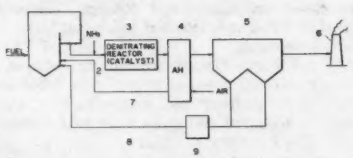
Katsuo Hashizaki; Toshio Koyanagi, and Atsushi Morii, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1988, Ser. No. 167,044

Claims priority, application Japan, Mar. 30, 1987, 62-74168; Aug. 12, 1987, 62-201145

Int. Cl.[4] F23J *3/00*

U.S. Cl. 110—216 **4 Claims**



1. An apparatus for treating a combustion exhaust gas which comprises a fire furnace, a denitrating reactor for denitrating said combustion exhaust gas discharged from said fire furnace, a dust collector for collecting solids in said exhaust gas passed through said reactor, and a transport pipe for circulating said solids collected by said dust collector through said fire furnace, said apparatus being characterized in that said transport pipe is provided with an arsenic removal means for removing arsenic from said solids.

4,796,546

COMBUSTION PLANT INCLUDING A CIRCULATION FLUID BED

Ola Herstad, Torslanda, and Lars Olausson, Angered, both of Sweden, assignors to Gotaverken Energy Systems AB, Gothenburg, Sweden

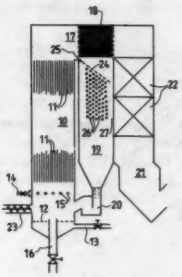
Filed Jul. 31, 1987, Ser. No. 79,924

Claims priority, application Sweden, Aug. 14, 1986, 8603419

Int. Cl.[4] F23J *3/00*; B01D *45/04*

U.S. Cl. 110—216 **6 Claims**

1. A combustion plant comprising a combustion shaft having a vertical axis with a lower end and an upper end as well as means for supplying fuel and inert material to form a particulate bed, first and second vertical shafts parallel to said combustion shaft, a horizontal passage connecting the upper ends of said shafts, a lock communicating the lower end of said first shaft with said combustion shaft, means to convey combustion gases away from said second shaft, means for supplying a fluidizing gas to the lower end of said combustion shaft for burning said fuel while causing fluid circulation up through said combustion shaft and down through said first shaft, a mechanical separator means in said horizontal passage, above said first shaft and including a plurality of mutually parallel plates being inclined in relation to the vertical axis of said first shaft and arranged to ensure a laminar gas flow from said combustion shaft to said second shaft while separating out entrained particles for a free drop down said first shaft, a heat exchanger comprising heat exchange surfaces traversing said first shaft, and being so distributed therein that at least one free vertical passage is formed for descending particles, below said separator means, and a particle distribution device located



below said separator means for directing said dropping particles in preselected proportions towards said heat exchanger and said passage, respectively.

4,796,547

FINE PARTICLE DISPERSING DEVICE FOR MIXING REACTANT WITH COMBUSTION GAS

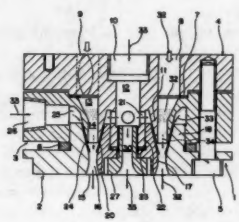
Yoshio Kobayashi, Sennan; Chiaki Tojo, Sakai, and Masayoshi Kinoshita, Nara, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jan. 14, 1987, Ser. No. 3,226

Claims priority, application Japan, Jan. 24, 1986, 61-13994; Jan. 28, 1986, 61-17332

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—263 **14 Claims**



1. A dispersing device comprising a body, a fine particle channel provided in said body, terminating in a spout in the form of an annular slit and having inner and outer peripheral sides, and gas clearances provided on both said inner and outer peripheral sides of the fine particle channel, inclined downstream with respect to said fine particle channel and communicating with said fine particle channel for emitting a gas into said fine particle channel.

4,796,548

METHOD OF CONDITIONING FIRESIDE FOULING DEPOSITS USING SUPER LARGE PARTICLE SIZE MAGNESIUM OXIDE

Gene A. Merrell, Huntingdon Valley, and Richard J. Sujdak, Morrisville, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 8, 1984, Ser. No. 608,053

Int. Cl.[4] F23J *11/00*

U.S. Cl. 110—343 **15 Claims**

1. Method of minimizing the deleterious effects of combustion residues on structures normally contacted thereby, com-

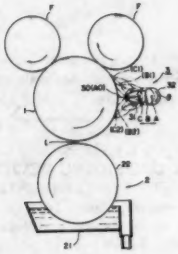
prising burning coal in a furnace combustion zone, and adding to said furnace an effective amount of a magnesium oxide material comprising particles the major mass fraction of which is about 150 microns in diameter or greater so as to increase the friability of said residues which may normally adhere to said structures.

4,796,549

INK SUPPLYING APPARATUS

Yuuichi Okamura, Tokyo, Japan, assignor to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,614
Claims priority, application Japan, Dec. 9, 1986, 61-292983
Int. Cl.[4] B41F *31/04*
U.S. Cl. 101—350 **1 Claim**



1. An ink supplying apparatus for use with inks having various viscosities, comprising:

a rotating printing cylinder;

a rotating cylindrical feeding roller having a mesh circumferential surface;

means for feeding ink onto said circumferential surface of said feeding roller;

means for feeding ink from said feeding roller to said printing cylinder;

a blade shaft mounted in a parallel relation to the longitudinal axis of said feeding roller, having a doctor blade pivotably disposed on said blade has, such that said doctor blade contacts said circumferential surface at a predetermined contact angle and with a predetermined pressure;

means for pivotably moving said doctor blade about said blade shaft;

shifting means for varying the distance between said blade shaft and said feeding roller axis in a common plane;

wherein said means for pivotably moving said doctor blade varies said contact angle from a tangential line following the rotation of said feeding roller to a tangential line in the counter direction of rotation of said feeding roller;

said means for pivotably varying said doctor blade and said means for varying the distance between said blade shaft and said feeding roller axis vary the pressure between said doctor blade and said circumferential surface of said roller;

said pivotably moving means comprising a worm wheel mounted on said blade shaft, a worm gear operatively engaging said worm wheel, and a first handle; and

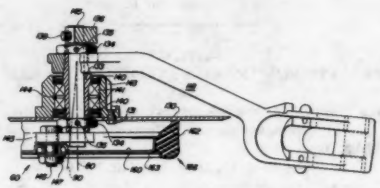
said shifting means comprising a bracket for supporting said blade shaft, a rack fixed to said bracket, a bracket base for receiving said bracket, at least one pinion gear pivotably mounted on said base, and a second handle in operative association with said pinion gear, whereby said contact angle is controlled by operating said first handle, and the space between said doctor blade and said circumferential surface is controlled by operating said second handle.

4,796,550

SINGLE ANGLED BLADE COULTER AND FERTILIZER OPENER

Terry L. Van Natta, Bettendorf, Iowa, and Donald R. Hartwig, Rock Island, Ill., assignors to Deere & Co., Moline, Ill.

Filed Mar. 29, 1985, Ser. No. 717,394
Int. Cl.[4] A01C *5/08*; A01B *39/08, 63/16*
U.S. Cl. 111—87 **1 Claim**



1. In an attachment for a seed planting implement of the type including a main frame adapted to be moved along the ground and having at least one seed planting unit connected to said main frame, said seed planting unit including a subframe and a seed trench forming unit attached to the subframe, the improvement comprising:

a single disk blade disposed forward of the seed trench forming unit and mounted to the main frame independently of the subframe, said single disk blade being disposed on a support arm at an angle to the direction of travel of said implement;

means for selectively adjusting a downwardly biasing force on said disk blade wherein said adjustable force means includes a compression spring disposed to interconnect a support attached to said main frame and said single disk blade, and a pivotable force adjustment strap pivotally attached to said support and having one end attached to said spring and having the opposite end selectively securable to said support in a plurality of position; and

means for selectively adjusting the working depth of said disk blade wherein said depth adjustment means includes a gauge wheel rotatably attached adjacent to said disk blade and having a center point selectively movable with respect to the center point of said disk blade, and wherein said single disk blade is rotatably mounted on a hollow spindle attached to the support arm and said gauge wheel is rotatably attached to an offset spindle of an arm assembly having a first shaft portion received and secured within said hollow spindle.

4,796,551

METHOD AND APPARATUS FOR PREPARING SEWING DATA

Masanori Nukushina, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan

Continuation of Ser. No. 890,348, Jul. 25, 1986, Pat. No. 4,704,977. This application Nov. 5, 1987, Ser. No. 117,468
Int. Cl.[4] D05B *3/02, 21/00*
U.S. Cl. 112—266.1 **7 Claims**

1. A method of preparing stitch data in an automatic sewing machine, comprising the steps of:

(a) storing stitch data for embroidery of a stitch pattern;

(b) calculating a first stitch position of the stitch pattern, said calculation comprising the steps of,

(i) reading out three basic stitch data items as one process unit,

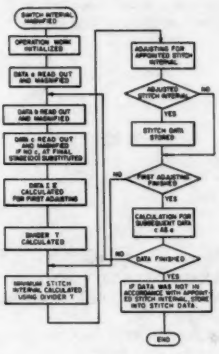
(ii) multiplying each of the basic stitch data items of said one process unit by a magnification factor,

(iii) adjusting each of said multiplied stitch data items to divide the stitch pattern into minimum stitch intervals, and

(iv) summing each of said adjusted stitch data items corre-

sponding to the multiplied stitch data of the selected stitch interval;

(c) calculating each subsequent stitch position of the stitch pattern, each subsequent stitch position calculated based on the previous stitch position; and



(d) moving one or both of a workpiece retainer and a sewing machine body relative to each other in accordance with each calculated stitch position.

4,796,552

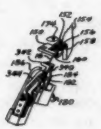
LATCH TACKER

Maximilian Adamski, Jr., Palatine, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed May 18, 1987, Ser. No. 50,360

Int. Cl.[4] D05B *65/00*

U.S. Cl. 112—285 **4 Claims**



1. An apparatus for positioning a chain of stitches for stitching onto material in a sewing machine having a needle and a throat plate, comprising:

a cutting device;

means for positioning the chain of stitches forwardly of the needle;

means for grasping the chain in the forward position;

means for releasing the chain from the grasping means; and

means for placing the chain in the path of the cutting device, wherein the grasping means comprises an elongated lower plate, an elongated nipper having a finger, and an elongated guide having an end portion defining a space between the end portion and finger.

4,796,553

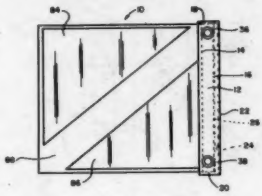
FLAG DEVICE SUCH AS A DIVE FLAG DEVICE AND FLOATS FOR USE THEREWITH

Sarah L. Cogswell, and Frederick R. Edington, II, both of No. 8 Sunset Ct., Avenue D, Marathon, Fla. 33050

Filed Nov. 28, 1986, Ser. No. 935,821

Int. Cl.[4] G09F *17/00*

U.S. Cl. 116—173 **24 Claims**



1. A flag and means for mounting same comprising

a panel formed of foam material capable of floating on water having finite thickness sufficient so that the foam material will resist bending and maintain the panel in a substantially flat unstressed condition, said panel having relatively smooth parallel spaced opposite surfaces and a plurality of side edges extending around and forming the periphery thereof,

an elongated flexible cloth-like member folded midway along its length with portions located adjacent opposite sides of the panel along one side edge thereof,

means attaching the cloth-like member to the panel with said cloth-like member and said one side edge of the panel forming a passageway therebetween,

means blocking the passageway adjacent one end thereof,

spaced attachment means attached to the panel adjacent to said one side edge,

an elongated rod member having an end portion extendible into the passageway being limited by the means blocking one end thereof for mounting said panel for rotational movement, and

means cooperatively engageable with the spaced attachment means on the panel including means extending around the passageway and the end portion of the rod member positioned therein adjustable to tighten the cloth-like member on the rod.

4,796,554

SAILBOAT

Wilhelm Laib, Mozartstr. 28, D-7030 Boeblingen, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,691

Claims priority, application European Pat. Off., Apr. 16, 1986, 86 105247

Int. Cl.[4] B63B *1/04*; B63H *9/04*

U.S. Cl. 114—39.1 **18 Claims**

1. A sailboat, comprising:

(a) a generally closed hull having a deck;

(b) a sail including at least one mast adjustably mounted on said hull;

(c) said mast forming a central part of said sail and having an edged cross-section;

(d) a plurality of generally horizontal said beams cooperating with said mast and being vertically displaceable relative thereto;

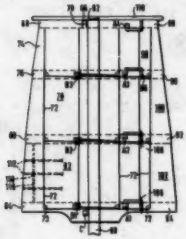
(e) said sail beams being interconnected by individual sail segments;

(f) each said segment being adapted to be reefed in the form of bellows between adjacent sail beams;

(g) each said sail segment being displaceable to assume a deployed position;

(h) said sail having a symmetrical airfoil contour top and including a laterally adjustable airfoil cap about the front thereof;

(i) said mast including a polygonal pipe means;



(j) said deck including a seat for rotatably mounting said pipe means therein; and

(k) said sail beams being individually connected to the next higher sail beam by at least one cable means and at least one winch motor means.

4,796,555

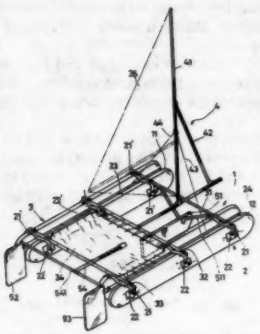
KNOCKDOWN TYPE INFLATABLE SAILBOAT

Herry Chang, No. 371-7, Hsin Ming Road, Nei Hu District, Taipei, Taiwan

Continuation-in-part of Ser. No. 16,360, Feb. 19, 1987, abandoned. This application Sep. 29, 1987, Ser. No. 105,526

Int. Cl.[4] B63B *7/08*

U.S. Cl. 114—39.1 12 Claims



1. A knockdown type inflatable sailboat comprising:

twin inflatable, elongated mutually spaced rafts having sides and fore and aft ends;

breakwater means disposed beneath said rafts for stabilizing said sailboat;

stress elimination system including a plurality of U-shaped fastening rods disposed on the upper surface of said rafts in a mutually spaced relationship with the ends thereof depending on opposite sides of said rafts;

stress distribution means coupling the ends of each U-shaped rod to a corresponding side portion of said raft whereby weight disposed on said U-shaped rods will be carried by the sides of said rafts said means comprising a plurality of mutually spaced plates, each plate affixed to a side of a raft adjacent an end portion of each of said U-shaped rods and a plurality of sleeves, each mounted on one of said plates surrounding an end each of said U-shaped rods;

at least one stress rod extending substantially the length of each raft along the upper surface thereof interconnecting respective U-shaped fastening rods, and at least three connecting rods extending laterally between said rafts connecting a pair of U-shaped rods thereon;

rudder means carried by said sailboat at the aft end of aid rafts for steering said sailboat;

sail means including a mast mounted on a connecting rod connecting the fore ends of said rafts.

4,796,556

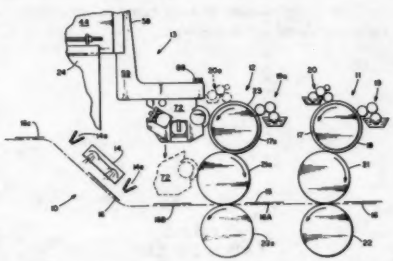
ADJUSTABLE COATING AND PRINTING APPARATUS

John W. Bird, Westport, Conn., assignor to Birow, Inc., Westport, Conn.

Filed Jun. 24, 1987, Ser. No. 65,954

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—46 23 Claims



1. An adjustable in-line coating application apparatus for attachment in association with a downmstream liquid application station of an offset printing machine having a plurality of liquid application stations, for converting said downstream liquid application station to a coating application station for applying either continuous or spot coatings over the printed surface of a succession of copy sheets carrying ink images printed thereon at one or more upstream liquid application stations, said downstream liquid application station containing a blanket cylinder positioned to contact said plurality of printed copy sheets and an offset plate cylinder in vertical elevation above said blanket cylinder and supported for adjustment into and out of coating association therewith, said coating application apparatus having vertical guide means, a coating carriage attached to said support for substantially vertical movement along said guide means, said carriage comprising a coating application unit, including a container for a supply of liquid coating composition and an elongate coating applicator roll supported to receive a uniform supply of said composition on the surface thereof and to transfer a uniform supply of said composition to the surface of either a plate cylinder or a blanket cylinder in coating association therewith, and mechanical adjustment means for moving said carriage on said guide means relative to said support vertically between elevations corresponding to the locations of the blanket cylinder and the plate cylinder of an offset printing machine in order to move said coating applicator roll into coating association with either said blanket cylinder or said plate cylinder, as desired.

4,796,557

DEVICE FOR APPLICATION WITH USE OF WEB VIBRATION ABSORBER

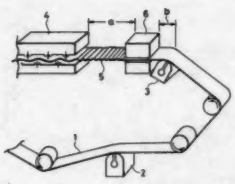
Norio Shibata; Tsunehiko Sato; Hideo Takeda, and Naoyoshi Chino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Apr. 17, 1987, Ser. No. 39,420

Claims priority, application Japan, Apr. 17, 1986, 61-87182; Apr. 19, 1986, 61-89215

Int. Cl.[4] B05C 5/02, 11/00

U.S. Cl. 118—62 12 Claims



1. A vibration absorber for damping vibrations induced in a running web, comprising a pair of gas ejection chambers facing each other across said running web, each said gas ejection chambers comprising:

a first chamber receiving pressurized gas;

a second chamber having a gas ejection surface facing a respective side of said running web; and

a distributor plate disposed between said first and second chambers for making uniform a pressure distribution of said gas in said second chamber, wherein a plurality of pairs of said gas ejection chambers are provided along a length of said running web, a separation between opposing gas ejection surfaces of respective pairs of said gas ejection chambers decreasing in an upstream direction of said running web.

4,796,558

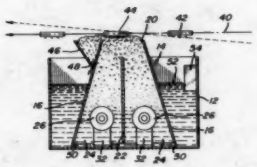
FOAM FLUXER

Raymond J. Chartrand, Kirkland, and Carlos A. Deambrosio, LaPrairie, both of Canada, assignors to Electrovert Limited, Ontario, Canada

Filed Feb. 19, 1988, Ser. No. 157,959

Int. Cl.[4] B05C 5/02

U.S. Cl. 118—74 5 Claims



1. A foam fluxer for fluxing components conveyed in a conveyor path above the fluxer, for installation in an open tank containing liquid flux, the fluxer comprising:

an aerator chimney housing with side walls and end walls for placement in and protruding above the open tank, the housing having a top foam outlet for positioning below the conveyor path,

at least one vertical internal divider located in the housing below the foam outlet, the divider forming at least two chambers, and

a porous aerator tube located in each chamber with connection means for a compressed gas supply to produce foam in each chamber, the foam from each chamber joining above the divider to exit upwards from the foam outlet.

4,796,559

APPARATUS FOR APPLYING A LIQUID TO A WEB OF MATERIAL

Walter Lohse, Herisau, Switzerland, assignor to Ulrich Steinemann AG, St. Gallen, Switzerland

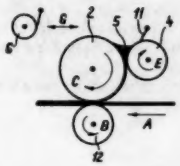
PCT No. PCT/CH86/00109, § 371 Date Apr. 17, 1987, § 102(e) Date Apr. 17, 1987, PCT Pub. No. WO87/01401, PCT Pub. Date Mar. 12, 1987

PCT Filed Jul. 28, 1986, Ser. No. 51,142

Claims priority, application Switzerland, Sep. 4, 1985, 3806/85

Int. Cl.[4] B05C 1/08

U.S. Cl. 118—210 11 Claims



1. Apparatus for applying a liquid to a web of material (3), comprising an applicator roller (2), means for driving the applicator roller in both directions of rotation, means for advancing the web of material under the applicator roller tangentially in relation to the surface thereof such that it moves in the same direction as or in the opposite direction to the direction of movement of the adjacent surface of the roller dependent upon the direction of rotation of the roller, and a metering roller (4) which can be adjusted toward the applicator roller (2) and which is so arranged that in conjunction with the applicator roller (2) it forms a reservoir zone (5) for the liquid to be applied, such that in a first direction of rotation of the applicator roller the liquid will flow downwardly through a gap formed at the bottom of the reservoir zone (5) between the applicator roller (2) and the metering roller (4) and from there is conveyed by the applicator roller directly onto the web of material, and in a second opposite direction of rotation of the applicator roller (2) the liquid is conveyed away from the reservoir zone (5) freely upwardly and is conveyed as a liquid film by the applicator roller over the highest point of the applicator roller and onto the web of material, and wherein there is provided a drivable distributor roller (6) which, when the applicator roller is driven in the second opposite direction, can be adjusted toward the applicator roller (2) in the region of the liquid film between the reservoir zone (5) and the line of contact between the web of material and the applicator roller (2), such that the liquid to be applied is metered by a gap formed between the distributor roller (6) and the applicator roller (2), and means comprising an adjusting device for so adjusting the distributor roller.

4,796,560

AUTOMATIC SOLDER PASTE APPLICATION TO CIRCUIT BOARDS

Jean P. Berger, Raleigh; Evans H. Pridgen, Pittsboro, and Alfred W. Owens, Raleigh, all of N.C., assignors to Northern Telecom Limited, Montreal, Canada

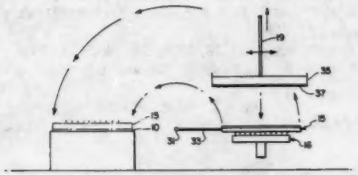
Continuation of Ser. No. 63,790, Jun. 22, 1987, abandoned, which is a division of Ser. No. 681,265, Dec. 13, 1984, Pat. No. 4,704,305, which is a continuation-in-part of Ser. No. 586,807, Mar. 6, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,031

Int. Cl.[4] B05C 1/02

U.S. Cl. 118—211 10 Claims

1. Apparatus for the application of solder paste to a circuit board, comprising:

(a) a perforated plate, the perforations in the plate being in a predetermined pattern facing in an upward direction;
(b) means for filling solder paste downwardly into said perforations;



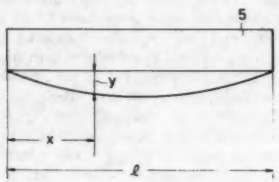
(c) means for rotating said plate 180° to a location adjacent a circuit board wherein said perforations face downwardly; and
(d) means for ejecting the solder paste from said perforations onto the circuit board.

4,796,561

ELECTROPHOTOGRAPHIC DEVELOPING DEVICE HAVING A SHAPED DOCTOR BOARD

Yasuo Takano; Hiroyoshi Tokoro; Junji Kobayashi; Masato Yamada; Toshimitsu Harada, and Kensei Hosoya, all of Ibaraki, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,716
Claims priority, application Japan, Sep. 12, 1986, 61-141109[U]
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—657 3 Claims



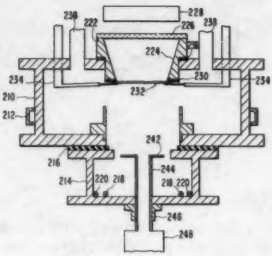
1. An electrophotographic developing device comprising:
a magnetic roll rotatably suported at bearing points in an electrographic developing device; and
a fixed doctor board disposed adjacent to, and spaced from, said magnetic roll for controlling the thickness of a layer of magnetic developing agent forwarded by said magnetic roll, wherein said doctor board has a longitudinal edge which confronts said magnetic roll and which is shaped in such a manner that a gap between said edge and said magnetic roll varies and has a minimum in the vicinity of the middle of said magnetic roll when said magnetic roll is stationary, and is substantially uniform along the entire length of the magnetic roll when said magnetic roll is rotating, thereby assuring a uniform thickness of said layer of said magnetic developing agent applied to a photosensitive drum rotating adjacent said rotating magnetic roll.

4,796,562

RAPID THERMAL CVD APPARATUS

Daniel L. Brors, Fremont; Larry R. Lane, San Jose; Mark W. Goldsborough, Santa Clara; Jason M. Samsel, Milpitas; Max van Mastrigt, San Jose, and Robert Foster, San Francisco, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 805,029, Dec. 3, 1985, Pat. No. 4,709,655. This application Jan. 15, 1987, Ser. No. 3,516
Int. Cl.[4] C23C *16/48*; F27D *11/00*
U.S. Cl. 118—725 25 Claims



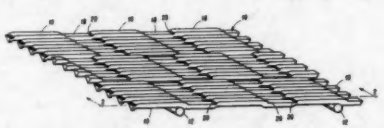
1. An apparatus for quickly heating a semiconductor wafer in a wafer processing machine, comprising:
a ring chuck and clamping means for holding a wafer face downward;
a holder for holding said ring chuck;
a window located above and spaced from the wafer;
a radiant heat source located above the window;
said window being sealed to said holder to provide a vacuum-tight seal, and said holder being sealed to the processing machine to provide a vacuum-tight seal.

4,796,563

WIRE MESH FLOORING

Dale H. Keuter, Earlville, Iowa, assignor to Eastern Iowa Pork, Earville, Iowa

Filed Apr. 20, 1987, Ser. No. 39,708
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—28 4 Claims



1. Flooring for livestock buildings comprising a plurality of longitudinally-extending wires which are parallel to each other and spaced apart a sufficient distance to permit the passage of waste through the flooring while close enough to prevent the feet of animals from being caught between adjacent wires, each longitudinally-extending wire having a plurality of alternate high and low portions along its length, the longitudinally-extending wires being arranged in a pattern so that a selected number of longitudinally-extending wires form a first group with the high portions and low portions aligned with each other and a selected number of the longitudinally-extending wires form a second group with the high and low portions aligned with each other, the first group of longitudinally-extending wires having its high portions staggered with respect to the high portions of the second group thus forming alternate groups of high and low portions throughout the flooring, and cross wires extending substantially transversely

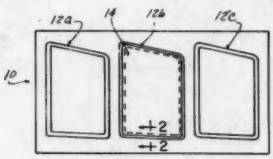
to the longitudinally-extending wires to provide support for the longitudinally-extending wires, the crosswires being positioned so as to be always beneath the high portions of the longitudinally-extending wires, the crosswires thereby all lying in the same plane.

4,796,564

CARRIER FOR SPRAYCOATING AUTO LIGHT COVERS

Francis M. Smith, 11060 Hupp, Warren, Mich. 48089

Filed Mar. 10, 1986, Ser. No. 837,890
Int. Cl.[4] B05C *11/14, 13/00, 13/02*
U.S. Cl. 118—500 **11 Claims**



1. A carrier for a work piece having a generally dome shaped outer surface and an open faced lower inside surface, to be spray coated with a coating material on the domed surface side, comprising:

a planar support board having an upper side adapted to receive said workpiece;

a locating center piece affixed to said support board configured to receive said hollow side of said workpiece to laterally locate said workpiece on said support board;

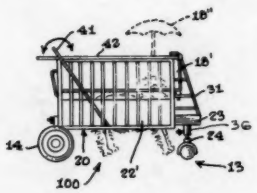
a renewable upper surface mounted on the upper side of said support board comprised of a plurality of layers of coating absorbent material loosely adhered to each other, whereby the topmost layer may be successively stripped away after continued exposure to coating overspray to present a renewed exposed surface adjacent said center piece.

4,796,565

PET TRANSPORTING, RESTRAINING AND EXERCISING ASSEMBLY

Rodney P. Charbeneau, 2909 Oakdale, Grand Prairie, Tex. 75050

Filed Jul. 6, 1987, Ser. No. 69,800
Int. Cl.[4] A01K *15/02, 29/00*
U.S. Cl. 119—101 **5 Claims**



1. The combination of a wheeled transport unit and a harness apparatus for exercising, transporting and protecting small domestic four legged pets wherein the combination comprises:

a wheeled transport unit including a base member having an enlarged opening and further provided with a front and rear wheel assembly wherein at least the front wheel assembly is removably mounted on the base member; and,

said rear wheel assembly comprises an elongated axle member provided with a pair of wheel elements; wherein, the axle member is movable secured to said base member such that said pair of wheel elements may be disposed in a retracted position relative to the longitudinal axis of the transport unit;

a cage member mounted on said base member and provided with a movable cage panel;

a panel member operatively associated with said base member and comprising at least one movable floor panel member capable of translation within the cage member to a position whereby the enlarged opening in said base member is exposed; and,

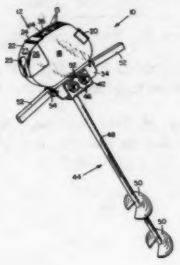
a harness apparatus operatively associated with said wheeled transport unit wherein said harness apparatus includes a generally rectangular body harness member; a plurality of strap elements attached to the body harness member and provided with cooperating securing means; and, a plurality of attachment elements secured to the body harness member; wherein, the harness apparatus is adapted to captively surround the torso of a pet; and, at least one of the plurality of attachment elements is adapted to releasably engage the cage member of the transport unit; whereby, the movement of the pet within the body harness may be transmitted via said at least one attachment element to impart movement to the wheeled transport unit, when the at least one movable floor panel has been raised to allow the feet of the domestic pet to extend through said enlarged opening in the base member of the wheeled transport unit.

4,796,566

CONVERTIBLE TETHERING SYSTEM

Thomas E. Daniels, 1603 Babcock, Suite 130, San Antonio, Tex. 78229

Filed May 21, 1987, Ser. No. 53,155
Int. Cl.[4] A01K *1/04*
U.S. Cl. 119—124 **6 Claims**



1. A tethering system for mobile and stationary use comprising:

a portable leash cartridge having a casing, a leash extending therefrom, and cartridge means for retracting said leash within said cartridge;

a housing for holding said leash cartridge, said housing having a cartridge opening for receiving and removing said leash cartridge and a leash cord opening for allowing a leash cord to pass from said cartridge through said housing;

means for removably anchoring said housing in a fixed location, said housing being pivotally mounted to said anchoring means wherein said cartridge is useful for mobile restraint of an animal on said leash, and when held within said housing, is useful for tethering an animal on said leash at a fixed location without becoming entangled; and

means for removably securing said leash cartridge within said housing, said securing means attached to said housing, said securing means comprising

a door member hingedly attached to said housing being oriented, sized, and shaped to at least partially obstruct

said cartridge opening when said door member is in a closed position; and

a U-shaped member hingedly attached by a hinge to said housing having first and second arms, and oriented so said first arm may be superposed over a portion of said door member by pivoting said U-shaped member about said hinge when said door member is in a closed position, and said second arm may be superposed over an opposing portion of said housing by pivoting said U-shaped member about said hinge.

4,796,567

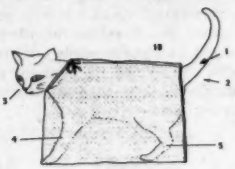
PROTECTIVE BAG FOR HANDLING PETS

Nancy J. Allan, and Lorraine J. Allan, both of 6633 Elwell St., Burnaby, B.C., Canada V5E 1J9

Filed Jun. 26, 1987, Ser. No. 67,717

Int. Cl.[4] A01K *29/00*; A01D *11/00*

U.S. Cl. 119—158 **9 Claims**



1. A bag for containing a pet while the pet is being bathed or groomed, said bag comprising a water-permeable mesh having an open end sized to receive the pet and a substantially closed end, and having adjacent said closed end an aperture formed in said bag for allowing the passage of the head of the pet.

4,796,568

POWER PLANT BURNING FUEL IN A FLUIDIZED BED

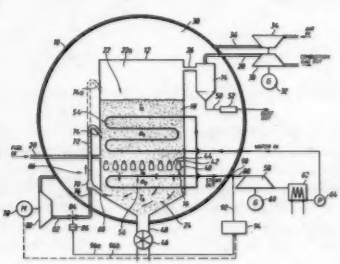
Krishna K. Pillai, Finspong, Sweden, assignor to ABB Stal AB, Finspong, Sweden

Filed Mar. 22, 1988, Ser. No. 171,597

Claims priority, application Sweden, Mar. 25, 1987, 8701228

Int. Cl.[4] F22B *1/00*

U.S. Cl. 122—4 D **10 Claims**



8. In a pressurized fluidized bed combustion plant which includes a bed vessel containing fluidized fuel and particulate bed material, with the bed divided into an upper fluidized bed region and a lower non-fluidized ash chamber region which receives hot bed material from the upper region, and with heat-exchange tubes embedded in the upper region to generate steam from water fed therethrough,

the improvement of superheating the steam by passing it through further heat-exchange tubes embedded in the lower region and providing means to recycle bed material from the ash chamber back to the fluidized bed region.

4,796,569

FURNACE BOILER AND PROCESS FOR THE OPERATION OF THE BOILER

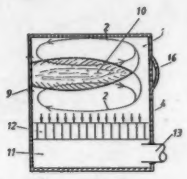
Rolf Bommer, Hochbildstrasse 21, 7770 Ueberlingen, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,540

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701439

Int. Cl.[4] F22B *37/00*

U.S. Cl. 122—6 A **25 Claims**



1. Process for operating a furnace boiler with a firebox having a cooled wall and at least one blowpipe to direct flame into the firebox, and heat exchangers connected to the firebox through which the flue gases flow, consisting of the steps of extracting heat from the flue gases essentially only by the heat exchangers and cooling the wall of the firebox only to the extent that, at maximum burner output, the temperature on the inner side of the wall does not exceed approximately 600° C. and, when the burner output is reduced to about 1/10 of maximum output, the temperature does not fall below approximately 180° C.

4,796,570

APPARATUS FOR HEATING STEAM FORMED FROM COOLING WATER

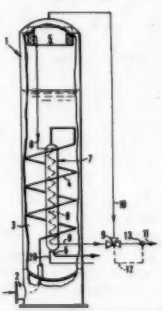
Herman J. Lameris, Utrecht, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Sep. 30, 1987, Ser. No. 79,534

Claims priority, application Netherlands, Aug. 26, 1986, 8602162

Int. Cl.[4] F22D *1/00*

U.S. Cl. 122—7 R **9 Claims**



1. An apparatus for heating steam formed from cooling water in a heat exchanger for hot gas, comprising:

a vessel having a compartment for cooling water, an inlet for

the gas to be cooled, and a collecting space for maintaining generated steam;

at least one gas transmitting tube for transmitting gas from the inlet into the water cooling compartment;

at least one steam tube connected to the collecting space; and

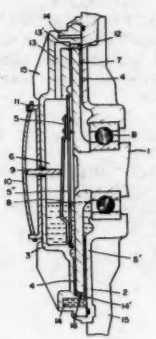
at least one superheater module situated within the cooling water compartment of said vessel, each module having an inlet end and an outlet end with the outlet end defining an outlet, each module being connected to at least one gas transmitting tube at its inlet end for the passage through the module of gas to its outlet end and out its outlet, and to a respective steam tube, said steam tube passing through the superheater module from its inlet end to its outlet end.

4,796,571

THERMAL RESPONSE TYPE FLUID FAN COUPLING DEVICE

Yuichi Ono, and Kazunori Takikawa, both of Numazu, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Sunto, Japan

Filed Dec. 14, 1987, Ser. No. 132,152
Claims priority, application Japan, Dec. 16, 1986, 61-299323
Int. Cl.[4] F16D *31/00*
U.S. Cl. 123—41.12 **15 Claims**



1. A thermal response type fluid fan coupling device for an internal combustion engine wherein:

the inside of a sealed chamber which is supported on a rotational shaft whose tip is provided with a driving disc through a bearing and which comprises a case and a cover having cooling fans on the exterior surface thereof is divided by a separating plate which has an oil flow adjusting hole into an oil accumulating chamber and a torque transmission chamber accommodating said driving disc;

a dam is formed between an exterior surface of said driving disc and an inner surface of said sealed chamber for the purpose of introducing oil into a circulated passage connecting said torque transmission chamber and said oil accumulating chamber;

the inside of said sealed chamber is provided with a valve member which is arranged to open said flow adjusting hole in said separating plate when the ambient temperature exceeds a predetermined level and to close the same when the ambient temperature falls below a predetermined level in association with transformation of a thermosensitive body provided on the front surface of said cover, said transformation occuring in accordance with the change in the ambient temperature;

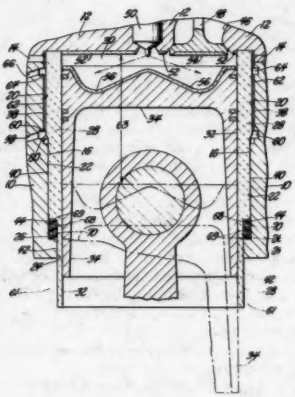
an effective oil contact area in a gap portion for transmitting torque which is disposed between the surfaces of said case and cover and the surface of said driving disc, the surfaces opposing each other at the outer periphery of said driving disc is increased or decreased in order to control the torque transmission from the rotational shaft to the follower side of said sealed chamber, said thermal response type fluid coupling device being characterized in that an idle oil accumulating chamber which is connected to an introducing gap that is connected to said torque transmission chamber is provided at an outer position over a dam in the radial direction in said sealed chamber side and oil introducing means which is arranged to communicate said oil accumulating chamber and said torque transmission chamber only when the engine is stopped is provided in said separating plate.

4,796,572

COMBUSTION CHAMBER LINER

Hans Heydrich, Phoenix, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1987, Ser. No. 55,962
Int. Cl.[4] F01P *3/00*
U.S. Cl. 123—41.42 **14 Claims**



1. In a piston engine comprising an engine having a cylindrical bore therein, and a cooperating engine head closing the bore: the improvement comprising a sleeve extending concentrically through the bore; the inner side surface of said sleeve being designed to slidably support a piston; the outer side surface of said sleeve having a step configuration defining a first annular shoulder facing away from the cylinder head; the bore having a step configuration defining a second annular shoulder facing the cylinder head; said second shoulder being further away from the cylinder head than the first shoulder, whereby an annular free space is formed between the two shoulders; a compression spring means located in the annular free space; said spring means being trained between the two shoulders to bias the sleeve toward the cylinder head; said sleeve having a sliding fit in the bore whereby the sleeve can undergo changes in its length in response to thermal stresses associated with the combustion process; said spring means having sufficient strength to maintain the sleeve in pressure contact with the cylinder head while at the same time accommodating axial thermal growth of the sleeve; the engine further including a protection means for isolating the sleeve from radially directed thermal or mechanical distortions of the cylindrical bore and for dampening the vibrations transferred to the sleeve from the engine block, the protection means being comprised of an annular portion of the cylinder bore surface remote from the end of the bore at the cylinder head, an opposing portion of the sleeve surface defining with the remote

cylinder bore surface portion a toroidal gap, and a stationary body of fluid filling the toroidal gap.

4,796,573

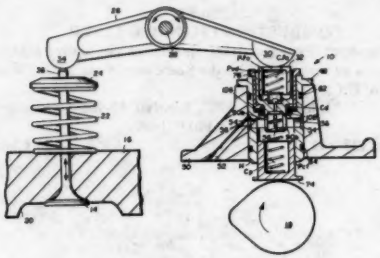
HYDRAULIC ENGINE VALVE LIFTER ASSEMBLY

Russell J. Wakeman, and Stephen F. Shea, both of Newport News, Va., assignors to Allied-Signal Inc., Morris County, Morris Township, N.J.

Filed Oct. 2, 1987, Ser. No. 103,879

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.16 **39 Claims**



1. In a hydraulic engine valve lifter of the type including a pair of pistons defining therebetween a pressure chamber, the improvement comprising a lash adjusting piston establishing a lash adjustment chamber with respect to at least one of said pair of pistons, and one-way valve means for permitting fluid to flow from said pressure chamber into said lash adjustment chamber when excess valve lash is present whereby such excess valve lash is adjusted, and damping control means for preventing motion damping of said at least one piston during an upstroke thereof while yet damping motion of said at least one piston at a predetermined position during a downstroke thereof, said damping control means including

a valve damper chamber,

primary and secondary passageways between said pressure and damper chambers,

a secondary passageway closing means movable between (i) an open position with respect to said secondary passageway to allow fluid to flow into said damper chamber during said upstroke of said at least one piston whereby motion damping thereof is prevented, and (ii) a closed position to prevent fluid from flowing from said damper chamber into said pressure chamber during a downstroke of said at least one piston, and

primary passageway closing means for closing said primary passageway at said predetermined position during said downstroke of said at least one piston, said primary passageway closing means closing said primary passageway subsequent to closure of said secondary passageway by said secondary passageway closing means, whereby motion damping of said at least one piston occurs.

4,796,574

SOHC TYPE INTERNAL COMBUSTION ENGINE

Noriaki Fujii; Takeshi Iwata, and Toshihiro Oikawa, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

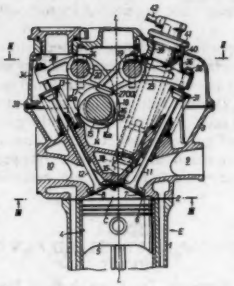
Filed Jul. 7, 1987, Ser. No. 70,493

Claims priority, application Japan, Jul. 9, 1986, 61-161479

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.23 **12 Claims**

1. An SOHC type internal combustion engine comprising a cylinder head which has a combustion chamber defined therein, a camshaft carried thereon, an ignition plug mounting hole opening to a center portion of a top surface of the combustion chamber and a protecting cylinder formed therein with an ignition plug insertion hole, wherein a journal for the camshaft has a diameter larger than a path of rotation of a lobe of a cam on the camshaft and is supported by a bearing hole formed in



a camshaft receiving wall which is provided on said cylinder head, and said protecting cylinder and said camshaft receiving wall are formed in a single piece.

4,796,575

WEAR RESISTANT SLIDE MEMBER MADE OF IRON-BASE SINTERED ALLOY

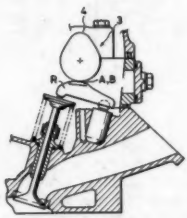
Toshihiko Matsubara, Kawagoe, and Akira Fujiwara, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,253

Claims priority, application Japan, Oct. 22, 1986, 61-249441; Oct. 22, 1986, 61-249442

Int. Cl.[4] F01L *1/18, 1/04*

U.S. Cl. 123—90.44 **5 Claims**



1. A wear resistant slide member made of iron-base sintered alloy, in which carbides are dispersed in a matrix phase; characterized in that 80% or more of the carbides contained in an alloy metallurgical structure have grain sizes of 4～15 μm, said carbides are dispersed at an average grain interval of 5～15 μm, and a field-of-view occupation area proportion of the carbides is 10～50%.

4,796,576

ADJUSTMENT MECHANISM FOR CERAMIC ROCKER ARM

Tooru Matsuura; Noboru Ishida, and Mitsuyoshi Kawamura, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 24, 1987, Ser. No. 65,880

Claims priority, application Japan, Jun. 30, 1986, 61-98968[U]

Int. Cl.[4] F01L *1/18*

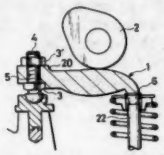
U.S. Cl. 123—90.43 **9 Claims**

1. An adjustment mechanism for a ceramic rocker arm, said

rocker arm having a valve engaging end and an opposite adjustment end, said mechanism comprising:

an opening through said adjustment end of said rocker arm, said opening having an unthreaded circular bore;

an externally threaded adjusting shaft disposed to pass through said opening;



an internally threaded locking member on said shaft disposed to engage the external threads of said adjusting shaft; and

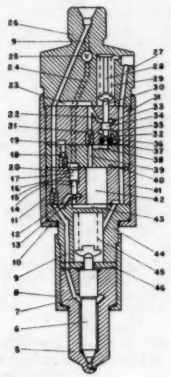
an internally threaded member having a threaded portion disposed to engage the external threads of said shaft, said threaded member being engaged on said adjustment end of said rocker arm.

4,796,577

INJECTION SYSTEM WITH PILOT INJECTION

George S. Baranescu, 5316 Howard Ave., Western Springs, Ill. 60558

Filed Jun. 16, 1986, Ser. No. 874,523
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—300 **20 Claims**



1. An internal combustion engine having at least one cylinder, each cylinder being provided with an injector which includes a nozzle whose delivery channel in opened and closed by a valve actuated by the nozzle spring, said injector including also a drain, and a high pressure channel connected by means with an injection pump and with the nozzle, the injection pump being connected to a fuel tank, said internal combustion engine being characterized by several capacities including the division of the fuel charge of each cycle in two portions of different amount, which are injected sequentially through the same injector, starting with the smaller portion which acts as a pilot for the main fuel charge, the two sequential injections being achieved by the same injection pump, through the storage of the pilot in an accumulator located inside the injector, the storage occuring during the injection of the main fuel charge, the accumulated pilot being injected by fuel expansion in the cycle following its accumulation, at controllable timing and in controllable amount, the main fuel charge being delivered by the injection pump at controllable timing and in controllable amount, when the temperature and pressure in the combustion chamber have substantially increased due to the combustion of the pilot, these capacities of the engine being achieved by means including

an accumulator connected with the high pressure channel, and with the nozzle,

means which control the connection between the high pressure channel and the accumulator,

means which control the timing of pilot injection, this timing being electronically programmed,

means which prevent a fuel flow from the accumulator towards the injection pump during the injection of the pilot,

means which control the fuel pressure in the accumulator,

means which control the residual pressure in high pressure channel,

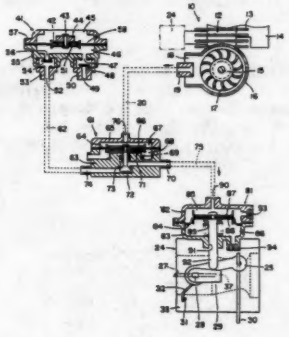
means for the electric ignition of the pilot, when the engine operates with fuels having low self-ignition property.

4,796,578

ANTI-OVERRUNNING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Kohji Nagasaka, Kawasaki; Takeshi Kobayashi, Yokohama, and Yoshimi Sejimo, Urayasu, all of Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

Filed Sep. 29, 1987, Ser. No. 102,383
Claims priority, application Japan, May 6, 1987, 62-110116
Int. Cl.[4] F02D *9/02*
U.S. Cl. 123—378 **1 Claim**



1. An anti-overrunning device for an internal combustion engine comprising an actuator responsive to control pressure for actuating a throttle valve of a carburetor in a direction of closing the valve, a vibrating pump actuated by vibration of the engine for directing control pressure to said actuator to cause said throttle valve to move in a closing direction, and a control valve actuated by air pressure of an engine cooling fan to connect said pump to said actuator to cause said throttle valve to move in a closing direction under conditions of overrun of said engine.

4,796,579

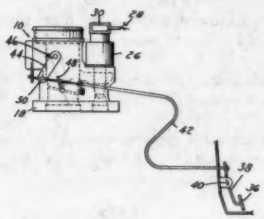
AUTOMOTIVE TYPE THROTTLE BODY

Brian C. Wolfe, Canton, and Thomas D. Wernholm, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 2, 1988, Ser. No. 162,844
Int. Cl.[4] F02M *7/12*
U.S. Cl. 123—336 **7 Claims**

1. A multi-stage throttle body having parallel primary and

secondary throttle bores defining air flow induction passages each open to ambient air at one end and adapted to be connected to an engine intake manifold at the other end for providing two independent passages of air to the engine, said primary and secondary passages each having throttle valve means therein movable between positions opening and closing the respective passages to control air flow therethrough, a drive-by-wire electrical actuator means for moving the primary throttle valve means, an operator controlled vehicle accelera-



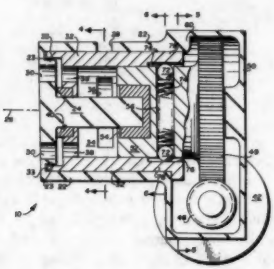
tor pedal electrically connected to the primary throttle valve means and mechanically connected directly to the secondary throttle valve means and depressible for effecting movement of the primary throttle valve means by the drive-by-wire means and for positively moving the secondary throttle valve means at times, and lost motion means in the connection between the accelerator pedal and secondary throttle valve means effecting movement of the secondary throttle valve means only after a predetermined depression of the accelerator pedal.

4,796,580

IDLE CONTROL VALVE FOR USE WITH A THROTTLE ASSEMBLY OF AN INTERNAL COMBUSTION ENGINE

Russell Wakeman, Newport News, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 11, 1987, Ser. No. 95,085
Int. Cl.[4] F02M 3/00
U.S. Cl. 123—339 **16 Claims**



1. An idle control valve for an internal combustion engine, said idle control valve having an air inlet and an air outlet to permit a controllable amount of air to flow therebetween, and including:

a valve body;

a valve spool;

means for mounting said valve spool within said valve body so that said valve spool is rotatable in first and second opposite rotational directions about an axis common to said valve spool and valve body;

said valve spool and valve body together including valve port means defining an alterable effective area which, in turn, permits an amount of air flowing through said valve body between said air inlet and outlet thereof to be correspondingly alterable;

drive means for rotating said valve spool about said common axis is said first and second opposite directions for altering said effective area of said port means to thereby responsively controllably alter the amount air flowing through said valve body between said inlet and outlet thereof;

clutch means for (i) said valve spool at torque levels below a threshold so as to transmit same to, and thus rotate, said valve spool, and (ii) releasing said engagement with said valve spool in response to said threshold torque being exceeded to allow relative slippage to occur between said drive means and said valve spool thereby preventing torque transmission to, and thus rotation of, said valve spool, and

seal means for effectively sealing said valve spool and valve body against air leakage, said seal means including,

(i) a generally U-shaped flange rigidly associated with a terminal end of said valve body; and

(ii) a finger flange rigidly associated with said valve spool adjacent said valve body terminal end, wherein

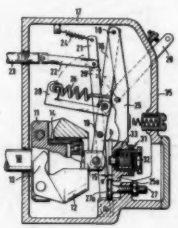
(iii) said finger flange and said U-shaped flange are interdigitated with one another in close fitting relationship so as to collectively establish a mechanical labyrinth seal.

4,796,581

CENTRIFUGAL RPM GOVERNOR FOR INTERNAL COMBUSTION ENGINES

Werner Brühmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,961
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321715
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—373 **5 Claims**



1. A centrifugal rpm governor for internal combustion engines having a governor member adjusting in accordance with the rpm, having a force-transmitting member subject to the force of at least one governor spring and having a torque-control capsule which is threaded in a positionally secured manner into a chamber in a portion of the force-transmitting member which includes a bore in axial alignment with said governor member and which can be acted upon by the governor member, said torque-control capsule includes a stop housing embodied as a screw sheath, said stop housing includes internal and external threads and an inside stepped longitudinal bore, an aperture in said stop housing in alignment with said bore in said chamber, a stop bolt received in said aperture, said stop bolt protrudes through said aperture beyond said bore in said chamber in the force-transmitting member with a dimension of its protrusion (b) which is dependent on the threaded position of the torque-control capsule in the force-transmitting member which determines a torque-control stroke, a torque-control spring, supported on one end on the stop bolt and on another end by a bottom end face of a cup shaped adjusting ring which has contin uous infinitely graduated external adjusting screw threads and is secured in a positionally fixed manner inside said

stop housing in the vicinity of its internal thread, said cup-shaped adjusting ring having a hollow-cylindrical, sheath-like wall in which said external adjusting screw threads have a normal, circular outer contour at its bottom end which is in abutment with said torque-control spring, and said adjusting ring is formed into an oval shape over a portion of its length prior to installation, in the vicinity of the sheath-like wall and has its greatest oval deformation in the vicinity of an end section open toward the outer end of the sheath-like wall of said adjusting ring.

4,796,582

ANTI-OVERRUNING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

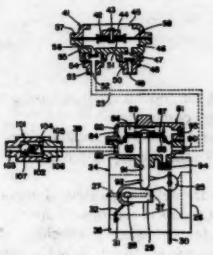
Yoshimi Sejimo, Urayasu; Toshiaki Tsubai, Sendai, and Teruhiko Tobinai, Izumi, all of Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

Filed Sep. 29, 1987, Ser. No. 102,133

Claims priority, application Japan, Apr. 10, 1987, 62-88451

Int. Cl.[4] F02D 9/02

U.S. Cl. 123—378 **5 Claims**



1. An anti-overrunning device for an internal combustion engine comprising a vibrating pump for generating pneumatic pressure by vibrations of the engine; an actuator having a spring-biased rod for urging a throttle valve lever in a direction of closing a throttle valve and responsive to the pneumatic pressure of said vibrating pump to act against said spring to open said throttle valve; and a vibration sensor positioned in a passage for communicating a pressure chamber of said actuator to atmosphere by virtue of the vibrations of the engine during overrunning thereof and cause said spring-biased rod to move said throttle valve in a closing direction.

4,796,583

ANTI-OVERRUNNING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Kohji Nagasaka, Kawasaki; Takeshi Kobayashi, Yokohama, and Yoshimi Sejimo, Urayasu, all of Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

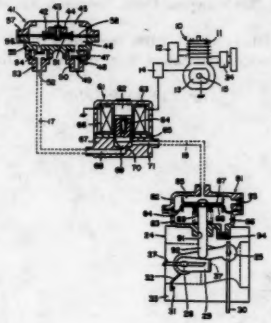
Filed Sep. 29, 1987, Ser. No. 102,354

Claims priority, application Japan, May 6, 1987, 62-110117

Int. Cl.[4] F02D 9/02

U.S. Cl. 123—378 **1 Claim**

1. An anti-overrunning device for an internal combustion engine comprising a vibrating pump for generating pneumatic pressure by vibrations of the engine, an actuator for actuating a throttle valve of a carburetor in a direction of closing the valve, and a control valve for controlling a flow of the pneumatic pressure from said vibrating pump to said actuator during overrunning of the engine, and said control valve being



actuated by virtue of the electromotive force of a generator driven by the engine.

4,796,584

INTAKE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE AND INTAKE CONTROL VALVE USED THEREIN

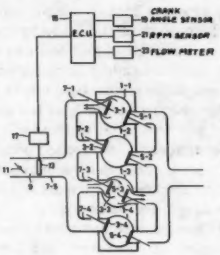
Hiroyuki Goto, Anjo; Tokio Kohama, Nishio; Yoshitaka Nishio, Nagoya; Hideki Obayashi, Okazaki, and Kazuyuki Horie, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 9, 1987, Ser. No. 12,548

Claims priority, application Japan, Feb. 7, 1986, 61-26259; Feb. 19, 1986, 61-34767; May 29, 1986, 61-125192

Int. Cl.[4] F02D 9/08, 9/10

U.S. Cl. 123—403 **25 Claims**



1. An intake control system in a multi-cylinder internal combustion engine having a plurality of engine cylinders connected to a common intake passage and having respective intake valves, said intake control system comprising:

an intake control valve disposed in said common intake passage;

an actuator for selectively opening and closing said intake control valve; and

an electronic control unit including:

means for generating an electric signal indicative of an operating condition of each said intake valves; and

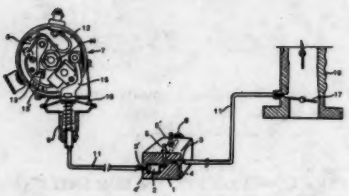
means for controlling said actuator on the basis of said electric signal so that said intake control valve is set to the closed state at a time earlier by a predetermined time period than a time that said intake valve is switched from the open state to the closed state and set to the open state in response to the closed state of said intake valve.

4,796,585

VACUUM ADVANCE REGULATOR FOR A SPARK IGNITION ENGINE

Sang H. Kim, 36-6 Songjang-Dong, Sungdong-Ku, Seoul, Rep. of Korea

Filed Oct. 27, 1986, Ser. No. 923,384
Claims priority, application Rep. of Korea, Oct. 31, 1985, 8122
Int. Cl.[4] F02P 5/10
U.S. Cl. 123—409 2 Claims



1. A vacuum advance regulator for an internal combustion engine having spark timing comprising:

(a) a body having a first bore and a second bore,

(b) a vacuum chamber located within said body and connected to the outside of said body by means of a nipple extending from one side of said chamber through the first bore and a nipple extending from the other side of said chamber through the second bore where the other side of the nipple attached to the first bore is connected by means of a vacuum hose to a carburetor and where the other side of the nipple attached to the second bore is connected by means of a vacuum hose to a vacuum advancer,

(c) a first adjustable throttle connected in-line with said nipple extending from the first bore,

(d) adjustable throttle in communication with said vacuum chamber, atmosphere and with said first throttle where said first and second throttles allow adjustment to set the spark timing, and

(e) wherein said first and second throttles are set to provide spark timing control in accordance with the following equation:

$$\theta(BTDC) = \frac{\left(\beta \times \frac{L}{350} - \beta\right)}{\pi} + \beta$$

where:

θ(BTDC)=angle before top dead center (°)

β=substitution parameter for engine speed in revolutions per minute

L=exhaust volume divided by the number of cylinder in cubic centimeters (cc)

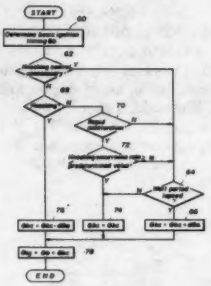
π=Pi or 3.1416.

4,796,586

METHOD OF AND APPARATUS FOR CONTROLLING IGNITION TIMING IN INTERNAL COMBUSTION ENGINE

Akira Tanaka; Akira Nagao; Yukihiko Suzuki; Hideji Yamada; Toyohei Nakajima, and Toshiyuki Mieno, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,606
Claims priority, application Japan, Jul. 22, 1986, 61-170934; Jul. 22, 1986, 61-170931
Int. Cl.[4] F02P 5/15
U.S. Cl. 123—425 3 Claims



1. An apparatus for controlling ignition timing in an internal combustion engine, comprising:

a first means for detecting an angular position of an engine crankshaft to generate an output signal indicative of engine speed;

a second means for detecting a state of engine load to generate an output signal in response thereto;

a third means for detecting a knocking condition of the engine to generate an output signal in response thereto;

a control means for receiving the output signals of the first, second and third means to determine a basic ignition timing of the engine based upon the detected engine speed and engine load and when the knocking condition is detected, adjusting the basic ignition timing in a retard direction, said control means comparing the detected engine speed with a predetermined low engine speed to determine a region of engine operation in which knocking control is unnecessary and when an engine operation is detected to be in the region with the ignition timing still retarded, slightly adjusting the retarded ignition timing in an advance direction, the slight adjustment occurring once per predetermined number of firings which are proportional to the engine speed, said control means generating an output signal based upon the determined ignition timing; and

ignition means for receiving the output signal of the control means to ignite an air/fuel mixture in a combustion chamber of the engine.

4,796,587

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toyohei Nakajima, and Yasushi Okada, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

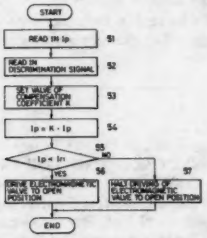
Filed Feb. 3, 1987, Ser. No. 10,553
Claims priority, application Japan, Feb. 4, 1986, 61-14758[U]
Int. Cl.[4] F02D 41/14
U.S. Cl. 123—440 5 Claims

1. An air/fuel ratio control system for an internal combustion engine, comprising:

an oxygen concentration sensor disposed within an exhaust gas passage of said internal combustion engine, said sensor having a linear output characteristic for producing an output signal varying in proportion to the concentration of oxygen in exhaust gases produced from said internal combustion engine;

an electric element having an electric characteristic which represents deviations of the actual value of said output signal from a predetermined reference linear output characteristic;

signal generating means for producing a discrimination signal in response to the electric characteristic of said electric element;



compensation means for performing compensation of said output signal of said oxygen concentration sensor in accordance with said discrimination signal, to produce a compensated output signal;

comparing means for comparing the compensated output signal with a reference signal corresponding to a target air/fuel ratio; and

air/fuel ratio adjustment means for adjusting the air/fuel ratio of the mixture supplied to said internal combustion engine, in accordance with a resultant signal produced by said comparing means.

4,796,588

FUEL CONTROL APPARATUS

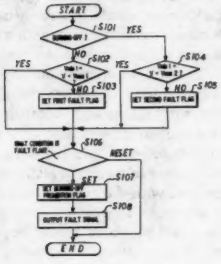
Setsuhiro Shimomura, and Yukinobu Nishimura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,066

Claims priority, application Japan, Apr. 22, 1986, 61-95139; Apr. 25, 1986, 61-97212; Sep. 18, 1986, 61-222520

Int. Cl.[4] F02D *41/22*

U.S. Cl. 123—479 **5 Claims**



1. A fuel control apparatus for calculating the quantity of fuel required for operating an internal combustion engine based on an output of a hot-wire type intake air quantity sensor disposed in an air intake passage for the internal combustion engine and supplying the optimum amount of the fuel to the engine by controlling a fuel control valve in accordance with the calculated value, characterized in that said fuel control apparatus comprises a burn-off control section for heating the hot wire of said sensor at a temperature high than a temperature in the normal operation, after said engine has been stopped, so as to burn off a deposit on said hot wire, means for stopping the operation of said burn-off control section when an output from said sensor crosses a predetermined value and means for outputting a signal indicative of a trouble in said sensor upon reaching a predetermined number of the stops of operation which exceeds one.

4,796,589

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

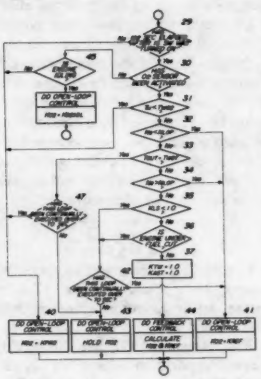
Sachito Fujimoto, and Kazunari Yamashita, both of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. In English), Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,486

Claims priority, application Japan, Mar. 31, 1987, 62-78336

Int. Cl.[4] F02M *23/08*; F02B *3/00*

U.S. Cl. 123—489 **8 Claims**



1. A method of effecting feedback control of the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust system and an exhaust gas ingredient concentration sensor arranged in said exhaust system, to bring the air-fuel ratio to desired values by correcting a fuel quantity to be supplied to said engine by means of a correction coefficient which varies in response to output from said exhaust gas concentration sensor, when said engine is operating in an air-fuel ratio feedback control region, the method comprising the steps of:

(a) determining whether said engine is operating in said feedback control region or another region other than said feedback control region;

(b) calculating an average value of values of said correction coefficient obtained while said engine is operating in said feedback control region, when it is determined that said engine is operating in said feedback control region; and

(c) correcting the calculated average value in dependence on a temperature of said engine and initiating said feedback control by using the corrected average value as an initial value of said correction coefficient, when it is determined that said engine has shifted to said feedback control region from said another region.

4,796,590

RAPID-RESPONSE METHOD AND DEVICES FOR DETECTION OF POOR COMBUSTION

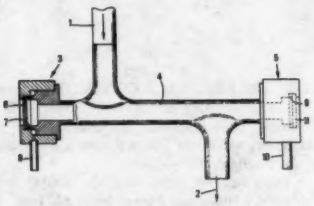
Paul Degobert, Rueil-Malmaison; Emmanuel Goldenberg, Poissy; Yvon Nadaud, Saint-Ouent, and Michel Molinier, St. Cloud, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 534,650, Sep. 22, 1983, abandoned. This application Nov. 29, 1985, Ser. No. 802,723

Claims priority, application France, Sep. 22, 1982, 82 16075

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **15 Claims**



1. A method of regulating combustion of a lean mixture by rapid-response monitoring of the gaseous effluents leaving a combustion chamber, which comprises emitting ultraviolet radiation to a zone of small volume traversed by at least part of the gaseous effluents leaving the combustion chamber, receiving at least part of the ultraviolet radiation which has passed through this zone; measuring the degree to which the ultraviolet radiation has been absorbed by a chemical compound contained in the gaseous effluents, said compound serving as an additive for detection purposes, and governing at least one parameter influencing combustion within said combustion chamber within said degree of absorption.

4,796,591

INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

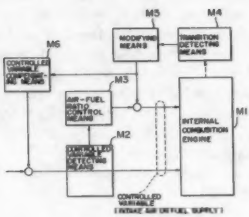
Masashi Kiyono, Anjo; Tomoaki Abe, Obu, and Mitsunori Takao, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 19, 1987, Ser. No. 87,031

Claims priority, application Japan, Sep. 3, 1986, 61-208356; Sep. 4, 1986, 61-208619; Sep. 8, 1986, 61-211270

Int. Cl.[4] F02M *51/00*; F02D *41/10*

U.S. Cl. 123—492 **16 Claims**



1. An internal combustion engine control system comprising:

controlled variable detecting means which measures one of the quantity of intake air and quantity of fuel supply as a control value reflect the operational state of an internal combustion engine;

air-fuel ratio control means which determines, basing on the measured controlled variable, a base control value used for controlling the other controlled variable;

transition detecting means which detects a transitional change in the operating condition of said engine;

modifying means which determines the value of modification for increasing or decreasing the determined base control value in accordance with the detected transistion; and

controlled variable compensating means which increases or decreases in accordance with the determined modification value the control value detect by said controlled variable detecting means,

wherein the transitional change detected by said transition detecting means is the acceleration of said engine, and

wherein said transition detecting means for detecting the engine acceleration comprises means for detecting that a throttle valve located in an intake pipe of said engine has operated from a full-closed state to an open state.

4,796,592

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

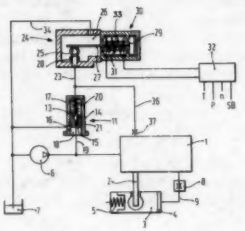
Gerald Höfer, Weissach; Helmut Laufer, and Max Straubel, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 415,302, Sep. 7, 1982, abandoned. This application Jun. 2, 1986, Ser. No. 871,135

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138607

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—502 **10 Claims**



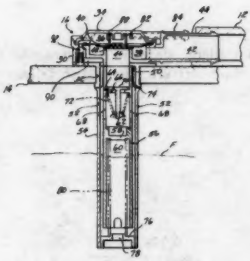
1. A fuel injection pump for internal combustion engines having a fuel supply pump driven in synchronism with said fuel injection pump, the pressure side of said fuel supply pump communicating with a work chamber ahead of an adjusting piston for the purpose of adjusting an injection onset and with said adjusting piston exposed to a restoring force, said fuel supply pump further communicating with a relief chamber for generating an rpm-dependent control pressure, a pressure control valve, an outflow opening in said pressure control valve communicating with said relief chamber and controlled by a control piston of said pressure control valve, said control piston being exposed on its rear side to a restoring force, a control pressure chamber in said pressure control valve located on the rear side of said control piston communicating via a throttle connection with the pressure side of said fuel supply pump and via a relief line communicating with said relief chamber, and a switching valve means disposed in said relief line controllable in accordance with operating parameters by an electric control means, and at least one spring-loaded closing means communicating with said relief chamber and with said control pressure chamber, whereby said control pressure chamber is relieved by said at least one spring-loaded closing means toward said relief chamber independently of the switching status of said switching valve means.

4,796,593

TANK MOUNTED VALVE FOR FUEL VAPOR RECOVERY SYSTEM

William F. Woodcock, Dearborn, Mich., and Loren H. Kline, Oregon, Ohio, assignors to Colt Industries Inc., New York, N.Y.

Filed Oct. 16, 1987, Ser. No. 109,194
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—518 10 Claims



1. In a vehicle mounted fuel vapor recovery system for receiving fuel vapor from the head space of the fuel tank of the vehicle and feeding said vapor at a controlled rate to the vehicle engine for combustion therein, said system including canister means for receiving and storing fuel vapor, purge means for withdrawing vapor from said canister at a controlled rate for combustion in said engine, and valve means for controlling the flow of vapor between said fuel tank and said canister means;

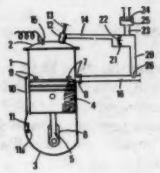
the improvement wherein said valve means comprises a valve housing having inlet passage means opening into the head space in said fuel tank and outlet passage means in direct substantially unrestricted communication with said canister means, pressure responsive means in said housing for placing said inlet passage means in communication with said outlet passage means when the pressure in said inlet passage means exceeds a predetermined pressure and for blocking communication between said inlet passage means and said outlet passage means when the pressure in said inlet passage means falls below said predetermined pressure, and float valve means responsive to the level of fuel within said tank for sealing said inlet passage means from the head space in said tank when the level of fuel within said tank exceeds a predetermined level, said pressure responsive means comprising a flexible diaphragm mounted in said housing to divide a cavity within said housing into a first chamber and a second chamber sealed from each other by said diaphragm, said inlet passage means including an inlet port opening into said first chamber and said outlet passage means including an outlet port opening into said first chamber, vent means venting said second chamber to atmosphere, and biasing means for biasing said diaphragm into overlying sealed relationship to said inlet port when the pressure in said inlet passage means is less than said predetermined pressure, and bypass means in said housing for placing said second chamber in communication with the head space of said tank when the pressure in said head space is at or below a predetermined sub-atmospheric pressure.

4,796,594

DEVICE AND METHOD FOR INJECTING FUEL INTO AN ENGINE, ASSISTED BY COMPRESSED AIR OR GAS

Pierre Duret, 124, boulevard Saint Germain, 75006 Paris, France

Continuation of Ser. No. 814,767, Dec. 30, 1985. This application Jul. 9, 1987, Ser. No. 71,357
Claims priority, application France, Dec. 28, 1984, 84 20059
Int. Cl.[4] F02M *25/00*
U.S. Cl. 123—531 4 Claims



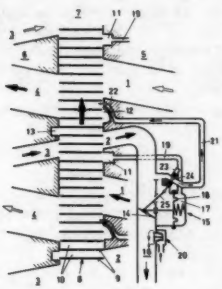
1. A method for effecting an injection of fuel in an internal combustion engine, the internal combustion engine including a pneumatic injection member and an exhaust pipe, the method comprising the steps of establishing a communication between the exhaust pipe and the injection member, communicating the communication between the exhaust pipe and the injection member with a gas source via an obstruction member including one of a stop valve or a check valve.

4,796,595

FREE-RUNNING PRESSURE WAVE SUPERCHARGER DRIVEN BY GAS FORCES

Ibrahim El-Nashar, Kloten; Francois Jaussi, Wettingen; Hubert Kirchhofer, Gebenstorf; Christian Komauer, Rieden; Andreas Mayer, Niederrohrdorf; Josef Perevuznik, Fislisbach, and Fritz Spinnler, Arisdorf, all of Switzerland, assignors to BBC Brown, Boveri Ltd., Baden, Switzerland

Filed Feb. 11, 1987, Ser. No. 13,931
Claims priority, application Switzerland, Feb. 28, 1986, 826/86
Int. Cl.[4] F02B *33/42*
U.S. Cl. 123—559.2 20 Claims



1. A free-running pressure wave supercharger to be driven by the exhaust-gas flow of an internal combustion engine, comprising:

a rotor casing having two end surfaces,

a cell rotor with cell walls within the rotor casing,

an air casing and a gas casing on the two end surfaces of the rotor casing,

a low-pressure air port for the supply of low-pressure air in the air casing,

a high pressure air port in the air casing for the removal of high pressure air,
a high-pressure exhaust-gas port for the supply of high-pressure exhaust-gas in the gas casing,
a low pressure exhaust gas port in the gas casing for the removal of low pressure exhaust gas,
a compression pocket arranged in the air casing after the low-pressure air port and before the high-pressure air port,
an expansion pocket arranged in the air casing after the high-pressure air port and before the low-pressure air port,
a gas pocket arranged in the gas casing between the two exhaust-gas ports,
a bearing for accepting the rotor shaft in the air casing,
said high-pressure exhaust-gas port and said low-pressure exhaust-gas port arranged so as to subject the cell walls of the cell rotor to high-pressure exhaust gas for the purpose of generating an impulse on the cell walls acting in the direction of rotation of the rotor,
said high-pressure exhaust-gas port and said low-pressure air port entering the rotor casing at an acute angle, referred to the vector of the rotor peripheral velocity,
a supercharge air line in communication with said high-pressure air port,
a supercharge air flap and a breather valve in the supercharge air line,
a control device being effectively connected to the supercharge air flap,
the control device being activatable by a pressure pulse signal derived from the pressure wave process,
said cell rotor and the rotor casing arranged so as to maintain a small as possible clearance between the end surfaces of the cell rotor and the air casing and the gas casing in the run-up phase of the pressure wave supercharger in order to keep the leakage losses of the exhaust gases and the air as small as possible,
port means for subjecting the cell walls of the cell rotor to gas action, said port means being located in one of the air casing and the gas casing and enter into the rotor casing, wherein the geometrical axes of the port means enclose an acute angle with the peripheral velocity vector of the rotor in the region of their entry into the rotor casing, said port means are each passage-connected with a position on the casing in which it is provided at which a positive pressure is present relative to the entry of these ports in the rotor casing,
the control device being in effective connection with the supercharged air flap provided in the high-pressure air port, said control device adapted to hold the supercharged air flap closed in the starting phase of the engine and, at the same time, relieve the high-pressure air port in such a way that gases escaping from the high-pressure air port are supplied to the port means.

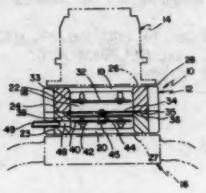
4,796,596

FUEL SAVING METHOD AND DEVICE FOR INTERNAL COMBUSTION ENGINES

Wesley F. Coker, 615 Vance Jackson, Apt. 208, San Antonio, Tex. 78201

Continuation-in-part of Ser. No. 899,881, Aug. 25, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 93,815
Int. Cl.[4] F02M *29/04*
U.S. Cl. 123—593 **27 Claims**

1. A fuel saving device comprising a housing adapted to be interposed between a carburetor and an intake manifold of an internal combustion engine; a chamber formed within said housing, said chamber having an inlet end opening adapted to register with a discharge passage of said carburetor and receive fuel-air mixture formed in said carburetor, and said chamber having an outlet end opening adapted to connect to said intake manifold; characterized by micro-porous filter means mounted within said chamber and extending transversely to the path of flow of said fuel-air mixture between said inlet and outlet end openings, said filter means being formed at least in part by a



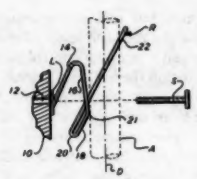
micro-porous filter plate adapted to permit the flow therethrough of the fuel-air mixture received from said carburetor.

4,796,597

ARROW REST

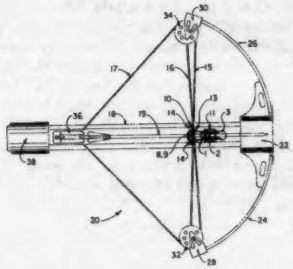
Henry Farro, P.O. Box 418, Hopatcong, N.J. 07843

Filed Feb. 9, 1987, Ser. No. 12,271
Int. Cl.[4] F41D *10/00*; F41B *5/00*
U.S. Cl. 124—41 A **10 Claims**



1. A rest adapted to be mounted on a bow and adapted to guide an arrow into its flight direction, comprising:
a flexible, elongated element adapted to doubly contact an arrow, said flexible element comprising a serpentine wire, and having:
(a) a lower segment adapted to extend laterally from a bow and positioned, sized and adapted to support the underside of an arrow, said lower segment being skewed and extending at an acute angle with respect to flight direction;
(b) a lateral segment connected to said lower segment, said lateral segment being spaced from and adapted to extend alongside a bow, said lateral segment having a jog adapted to receive an arrow to make single-point contact at said jog, said lateral segment comprising a serial pair of lateral guides oriented with respect to each other at an obtuse angle to form an apex adapted to bear laterally against an arrow; and
(c) a connecting segment connecting between said lower and lateral segments, said lateral segment being positioned above said lower segments; and
mounting means adapted to attach said flexible element to a bow, the portion of said lateral segment between said jog and said mounting means being acutely bifilar and free to flex, said mounting means comprising:
a loop oriented in a plane parallel to flight direction; and
a flexible support segment connected between said loop and said lateral segment to space it away from said loop and adjacent to flight direction.

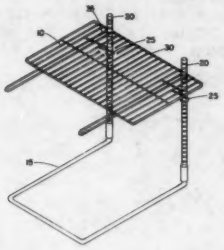
4,796,598
RETRACTABLE ARROW LAUNCH RAMP WITH COMPOUND CROSSBOW
Robert L. Jones, 432 Adams St., Elyria, Ohio 44035
Filed Mar. 6, 1987, Ser. No. 22,981
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—25 **2 Claims**



1. A compound crossbow comprising:
an elongated hollow stock member having first and second terminating end portions,
a pair of bow limbs disposed adjacent said first terminating end portion, said bow limbs each terminating at one end thereof in a cable pulley assembly, each pulley assembly comprising two wheel pulleys,
an endless arrow cable strung about said pulley assemblies thereby forming a pair of crossed over cables positioned forward of a third cable, said third cable adapted to engage an arrow,
an arrow launch ramp assembly disposed within the hollow stock member and located at a position defined as being past a mid-point between said first and second stock terminating ends, said arrow launch ramp being pivotally mounted onto said stock member and including a forward terminating end having a pair of generally parallel spaced arms and a seat portion describing a surface generally parallel to said stock member when said arrow launch is in an upward position,
trigger and arrow holding means mounted on said second terminating end of said stock member,
biasing means for normally retaining said arrow launch ramp in an arrow support position when said third cable is drawn and hooked to the arrow holding means,
the forward most part of an arrow being placed upon said seat portion and the most rearward part of said arrow engaged by said third cable, and
means for urging said arrow launch ramp to a position generally parallel to a plane described by said stock member upon the release of said third cable thereby removing said arrow launch ramp from the arrow flight path upon the discharge of said arrow.

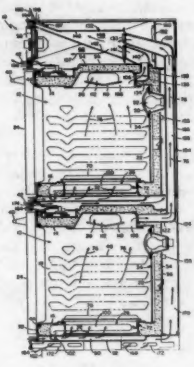
4,796,599
PORTABLE COOKING GRILL DEVICE
Robert Cooper, 910 Steele St., Denver, Colo. 80206
Filed Apr. 11, 1988, Ser. No. 179,662
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—30 **6 Claims**

1. A cooking grill device comprising:
(a) A base;
(b) Vertical posts removably attached to the base;
(c) A grill having a rod extending along the rear edge of the grill, and a plurality of parallel rods extending perpendicular thereto from the front to the back of the grill; said grill being removably attachable to the vertical posts, with each of the vertical posts passing through the grill between adjacent parallel rods, and with the rod extending along the rear edge of the grill braced against the back of the vertical posts; and



(d) Braces attached to the grill, extending diagonally downward and rearward from the grill, the distal ends of which are braced against the front of the vertical posts.

4,796,600
GAS WALL OVEN
James E. Hurley, Allentown, and Robert H. Stettler, Reading, both of Pa., assignors to Raytheon Company, Lexington, Mass.
Filed May 14, 1987, Ser. No. 49,498
Int. Cl.[4] A21B *1/00*
U.S. Cl. 126—273 H **11 Claims**



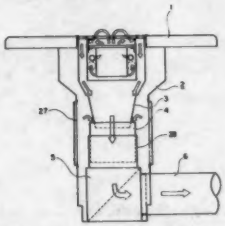
1. A gas wall oven, comprising:
an oven compartment comprising a top, bottom, side and back walls, and a door;
a burner box proximate said bottom;
a first burner positioned in said burner box;
means for providing secondary combustion air from the front of said oven to said burner box;
a second burner proximate said top;
means for channeling primary combustion air from the front of said oven to said second burner; and
said providing means being substantially isolated from said channeling means to prevent first burner combustion products from recirculating through said second burner and said channeling means back to said first burner when said first burner is activated and said second burner is off.

4,796,601

SMOKELESS ROASTER

Takeshi Yamada, Nagoya, Japan, assignor to Shinpo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 12, 1987, Ser. No. 119,815
Int. Cl.[4] F24C *15/20*
U.S. Cl. 126—299 R **12 Claims**



1. A smokeless roaster comprising:

(a) an upper support wall extending horizontally and having an opening contained therein;

(b) a roasting unit comprising an outer box having an opened upper end, said outer box being mounted and supported within said opening in said upper support wall by end edges thereon, an inner box having an opened upper end contained and supported in the outer box by end edges thereon, said inner box having a metal grill contained at an upper portion thereof and a burner provided at a lower portion thereof, and an exhausting unit provided at a lower part of said roasting unit, said exhausting unit diminishing in outer and inner diameter as it extends away from said lower part of said roasting unit;

(c) a movable draft pipe vertically, slidably fitted on the outer circumference of said exhausting unit, said movable draft pipe being capable of introducing outside air into gas exhausted from said roasting unit and regulating a suction force applied to said roasting unit, said movable draft pipe additionally having an inner diameter approximately equal to the maximum outer diameter of said exhausting unit;

(d) a connector box provided at a lower part of said movable draft pipe and connected therewith at a side surface thereof through a fixed pipe, said connector box containing a static pressure equalizer comprising a slit of triangular shape, said slit gradually widening from a lower portion to an upper portion thereof and separating an inner exhaust passage from an outer exhaust passage, said static pressure equalizer equalizing said suction force applied to said roasting unit with a static pressure; and

(e) a duct unit provided at the side of said connector box and attached thereto, said duct unit leading to a source of said suction force.

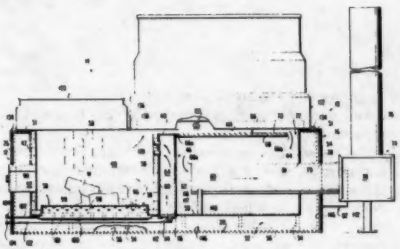
4,796,602

MAPLE SYRUP VAPORIZER APPARATUS WITH HOLLOW SHELL RECIRCULATION ARCH

Arthur H. Atkinson, Burlington, and David E. Buttolph, Fairfax, both of Vt., assignors to Small Brothers U.S.A., Inc., Swanton, Vt.

Filed Nov. 23, 1987, Ser. No. 123,744
Int. Cl.[4] A01G *13/06*; B01D *1/00*
U.S. Cl. 126—59.5 **12 Claims**

1. A maple syrup vaporizer apparatus comprising a vaporizing pan assembly, a hollow shell recirculation arch underlying and supporting said vaporizing pan assembly and being sealably coupled thereto said hollow shell recirculation arch comprising an outer sheet metal shell including laterally spaced vertical sidewalls, longitudinally spaced vertical front and rear walls, and a bottom wall edge coupled at opposite ends to said front wall and rear wall, respectively and laterally edge coupled to respective lateral sidewalls, an inner shell upwardly open within said outer shell defined by at least laterally opposed sidewalls and a front wall and a rear wall at opposite ends thereof, said inner shell being sized such that at least over a portion of its width and length, it forms with said outer shell a first heat exchange chamber therebetween a bridge wall interposed within said inner shell, intermediate of said inner shell front wall and rear wall and forming, with said inner shell front wall a fire box, and with said rear wall of said inner shell, a second heat exchange chamber, said first and second heat exchange chamber defining a regenerative heat exchanger, an insulated deck extending horizontally over the major portion of the length of the second heat exchange chamber having a front edge sealed to said bridge wall and a rear edge spaced from the vertical rear wall of said inner shell, brickwork lining the interior surfaces of the fire box, the fire box being open at the top and directly facing the bottom of the pan assembly, and wherein means are provided within at least one of said hollow shell regeneration arch and said pan assembly for forming a



horizontal passage from said fire box to the rear edge of the insulated deck for permitting products of combustion to flow from the fire box between the insulated deck and the bottom of the pan assembly and for entering the second regenerative heat exchange chamber by reverse flow about the rear edge of the insulated deck, and a smoke stack assembly including a horizontal smoke stack pipe fixedly mounted to the arch, projecting through the rear wall of the outer shell and the rear wall of the inner shell, and extending over the major length of the regenerative heat exchanger section of the arch and having an open end facing the bridge wall and spaced slightly therefrom, and means for forcing fresh combustion air into the first regenerative heat exchange chamber between the inner and outer shells for flowing the length of the arch, for preheating of the combustion air and means for discharging preheated combustion air as a primary air stream into the fire box for facilitating the combustion of fuel within the fire box in contact with the preheated fresh combustion air.

4,796,603

PAD-LIKE IMPLANT

Hermann Dahlke, Hamburg, and Hans-Rainer Willmen, Grevenborich, both of Fed. Rep. of Germany, assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 4, 1987, Ser. No. 92,908
Int. Cl.[4] A61B *19/00*; A61F *2/02*
U.S. Cl. 128—899 **12 Claims**

1. Pad-like implant of resorbable material for the treatment

of hernias, comprising a cushion-like or hose-like body closed on all sides, having an outer enclosing sleeve formed of porous

sheet-like material, which is filled with a filling of discrete pieces of resorbable material.

4,796,604

ENDOSCOPE AND A LIGHT GUIDE THEREOF AND A METHOD FOR MANUFACTURING THE LIGHT GUIDE

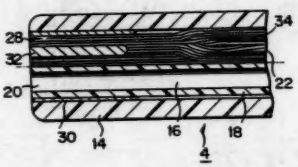
Masahiro Kawashima, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,241

Claims priority, application Japan, Feb. 13, 1987, 62-29732

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **12 Claims**



1. An endoscope comprising:

an insertion section having an internal space;

light guide means contained in the internal space of the insertion section and adapted to guide a illumination light, said light guide means including a number of elongated optical fibers having individual distal end portions bound into a bundle and bonded together; and

spacing means contained in the distal end portion of the bundle of optical fibers, with the optical fibers kept loose on the proximal-end side of the distal end portion of the optical fiber bundle to provide gaps among the optical fibers.

4,796,605

INCUBATOR

Migaku Sasaki; Eiji Koike; Toshio Ohtomo, and Jun Hirose, all of Urawa, Japan, assignors to ATOM Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 69,035

Claims priority, application Japan, Jul. 11, 1986, 61-163266; Jul. 11, 1986, 61-106447[U]; Jul. 11, 1986, 61-106448[U]

Int. Cl.[4] A61B *19/00*

U.S. Cl. 600—22 **9 Claims**

1. An incubator consisting of an incubator body, an incubating chamber located above the incubator body for accommodating an infant, air supply means disposed below the incubating chamber for supplying heated and humidified air to said incubating chamber, and a partition plate for partitioning said air supply means from said incubating chamber, said air supply means comprising:

means for providing air flow through the air supply means from an upstream location to a downstream location;

a heating chamber provided with heating means for warming the air to be supplied to said incubating chamber;

a dry chamber located downstream from and communicating with said heating chamber, said dry chamber having a bottom arranged parallel to the direction of air flow;

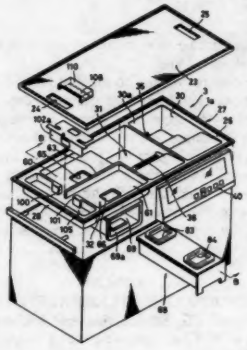
a wet chamber arranged adjacent to said dry chamber and having a bottom arranged parallel to the direction of air flow;

a first partition wall arranged perpendicular to the air flow for preventing air flow between said wet chamber and said heating chamber and said dry chamber;

a water tank disposed below said dry chamber and said wet chamber and containing humidifying water;

an outlet opening formed in the bottom of said dry chamber for communicating said dry chamber with said water tank;

an inlet opening formed in the bottom of said wet chamber



for communicating said wet chamber with said water tank;

a mixing chamber arranged downstream from said dry chamber and said wet chamber;

a second partition wall arranged perpendicular to said flow of air for preventing flow of air between said mixing chamber from said dry chamber and said wet chamber, said second partition wall having a first opening formed therein for communicating said dry chamber with said mixing chamber and a second opening formed therein for communicating said wet chamber with said mixing chamber;

first restricting means for regulating the flow rate of the air through said first opening; and

an air outlet provided in said partition plate for communicating said incubating chamber with said heating chamber and an air inlet provided in said partition plate adjacent said mixing chamber for communicating said mixing chamber with said incubating chamber.

4,796,606

DRIVE UNIT FOR MEDICAL PUMP

Sadahiko Mushika, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 27, 1987, Ser. No. 89,792

Claims priority, application Japan, Aug. 27, 1986, 61-201091

Int. Cl.[4] A61B *19/00*

U.S. Cl. 600—18 **7 Claims**

1. A drive unit for medical pump comprising

pressure producing means for producing a driving pressure in the form of an alternating positive and negative pressure;

fluid isolator means having its interior divided into a primary

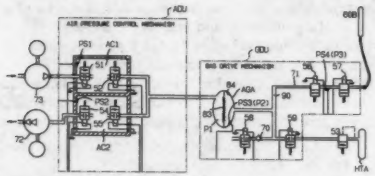
and a secondary side, with the primary side being connected to the output of said pressure producing means;

connection means internally containing a fluid passage for connecting the secondary side of the fluid isolator means to a medical pump;

first valve means for supplying a given fluid to the interior of the connection means;

second valve means for exhausting the fluid within the connection means to the exterior thereof;

first pressure detecting means responsive to the pressure



within the connection means to produce a corresponding electrical signal and

electronic control means connected to said first and second valve means and said first pressure detecting means for monitoring the electrical signal developed by the first pressure detecting means when said pressure producing means produces a positive pressure to thereby determine the pressure within the connection means and for controlling flow of fluid through the first and the second valve means in accordance with the pressure thus determined to control the pressure within said connection means.

4,796,607

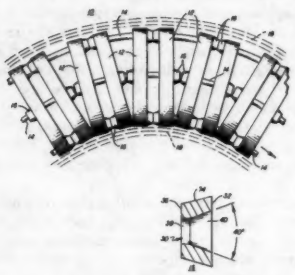
ENDOSCOPE STEERING SECTION

Jimmie B. Allred, III, Skaneateles, and Richard Bingham, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,714

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **13 Claims**



1. In a steerable endoscope or borescope of the type having a viewing head, a cable-bendable steering section proximally of the viewing head and including a flexible sheath, a plurality of axially aligned flat washers each having a central passage and a plurality of peripheral bores therethrough, pairs of which are generally diametrically disposed, a plurality of steering cables passing through respective axially aligned peripheral bores of said washers, and pairs of spacer beads disposed at the locations of at least certain peripheral bores associated with certain ones of said steering cables and serving to define bending locations for said steering section such that displacement of one opposed pair of the steering cables results in bending of the steering section; the improvement wherein said spacer beads are tapered beads disposed over said certain ones of said cables and have a relatively wide base surface facing the associated one of the successive washers and a relatively narrow flat nose surface facing a like nose surface of the other of the pair of spacer beads, wherein said beads each have an axial bore therein that is flared out towards said base surface to prevent said spacer bead from binding on said steering cable.

4,796,608

SHOCK WAVE GENERATOR FOR AN APPARATUS FOR NON-CONTACTING DISINTEGRATION OF CALCULI IN THE BODY OF A LIFE FORM

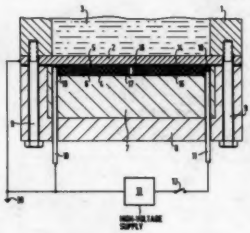
Georg Koebler, Geisfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 14, 1987, Ser. No. 49,518

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1986, 3620189

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **12 Claims**



1. A shock wave generator comprising:

a housing having a volume containing a shock wave transmitting medium;

a membrane consisting of electrically conductive material, said membrane terminating said volume on one side;

means for applying a first potential to said membrane;

a high voltage source having terminal means for supplying a second potential and terminal means for supplying a third potential, said high voltage source being capable of generating a current pulse;

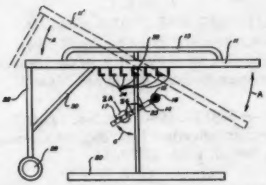
a coil having two terminals, said coil being disposed next to said membrane and having two layers of helical windings disposed congruently in respective parallel planes, said layers being connected in series and being wound in respective winding directions such that the respective magnetic fields of said two layers intensify each other upon a current flowing through said coil; and

means for respectively connecting said terminals of said coil to said terminal means for supplying said second and third potentials of said high voltage source for respectively applying said second and third potentials to said terminals of said coil and for releasing said current pulse into said coil, the high voltage dropping along said coil, thereby generating respective voltage differences in said layers of said coil relative to said membrane and one of said layers exhibiting a smaller voltage difference relative to said membrane than the other of said layers, when said coil is connected to said high voltage source, and said one layer exhibiting said smaller voltage difference being disposed immediately adjacent said membrane.

4,796,609
TILTABLE BACK TRACTION TABLE HAVING ADJUSTABLE BALANCE POINT AND BUMPER

Emmet T. Rix, P.O. Box 261, Paradise, Calif. 95967

Filed Apr. 10, 1987, Ser. No. 36,885
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—74 5 Claims



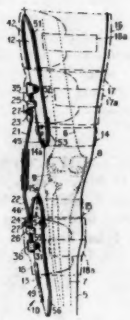
1. A back traction table, comprising:
a platform having a head end, a foot end, a top surface and a bottom surface;
a base having a top and a bottom;
balancing means positioned substantially at said top of said base;
a series of retainers attached to said bottom surface of said platform offset from each other and positioned at intervals between said foot end of said platform and said head end of said platform, attachable to said balancing means so that said platform substantially balances on said balancing means when positioned thereon, at least two of said retainers having a planar first portion oriented substantially perpendicular to said platform and planar second portion extending from the end of said first portion remote from said platform and oriented substantially perpendicular to said first portion and extending toward said head end of said platform, said retainers being sized and offset from each other so that said balancing means fits between said retainers and into an area between said second portion of one of said retainers and said bottom surface of said platform, thereby minimizing the likelihood that said platform will slip off of said balancing means during use of said back traction table, and
a leg support positioned near said foot end of said platform which captures an individual's leg so that, when said individual lies down upon said top surface of said platform with said individual's head positioned toward said head end of said platform, said individual is restrained from sliding away from said foot end of said platform.

4,796,610
LATERAL IMPACT KNEE GUARD AND MEDIAL COLLATERAL LIGAMENT KNEE BRACE

Hendrick L. Cromartie, Floyd County, Ga., assignor to Donjoy, Inc., Carlsbad, Calif.

Filed Jul. 2, 1987, Ser. No. 69,503
Int. Cl.[4] A61F 5/00, 5/04
U.S. Cl. 128—80 C 8 Claims

1. A knee guard and brace, which comprises:
(a) a side member which is adapted to fit on the outer side of a wearer's leg, the side member having a pair of thigh and calf support pads, each support pad including an elongated, generally rigid shell which extends approximately the length of the pad of which the shell is a part;
(b) means situated generally between the pads for interconnecting the ribs, the ribs and the interconnecting means forming an arch over the side of the knee;
(c) first means for flexibly connecting one end of a first rib to the thigh support pad at at least two points thereon which are transversely spaced from each other and which are disposed generally midway between the endpoints of the thigh support pad, any movements of end sections of the thigh support pad distal from each other occurring simultaneously but alternately inwardly and outwardly about an imaginary line connecting said two points on the thigh support pad, a first end section of the thigh support pad which is disposed proximate to the knee moving away from the first rib when the first end section is moved inwardly and said first end section moving toward the first rib when the first end section is moved outwardly;
(d) second means for flexibly connecting one end of a second rib to the calf support pad at at least two points thereon which are transversely spaced from each other and which are disposed generally midway between the endpoints of the calf support pad, any movements of end sections of the calf support pad distal from each other occurring simultaneously but alternately inwardly and outwardly along an imaginary line connecting said two points on the calf support pad, a second end section of the calf support pad which is disposed proximate the knee moving away from the second rib when the second end section is moved inwardly and said second end section moving toward the second rib when the second end section is moved outwardly, so that the first and second connecting means not only help to dissipate the impact of any lateral blows to the arch but also allow for adjustments in the orientation



of each pad relative to the contiguous rib to accommodate differences between individual wearers in the inclination of the femur relative to the tibia;
(e) first means mounted on the thigh support pad generally between the ends of the first rib but not connected thereto for limiting the extent to which the first end section of the thigh support pad can move inwardly independently of the first rib;
(f) second means mounted on the calf support pad generally between the ends of the second rib but not connected thereto for limiting the extent to which the second end section of the calf support pad can move inwardly independently of the second rib, the first and second ribs disengaging from said first and second limiting means, respectively, under the impact of a lateral blow to the arch, so that the arch can deform inwardly essentially independently of the first and second end sections of the thigh and calf support pads, respectively; and
(g) means for securing the pads to the wearer's leg, the securing means including a pair of straps for holding said leg against the first and second end sections, so that the femur and the tibia cannot pull away from the thigh and calf support pads, respectively.

4,796,611

FRACTURE BRACE

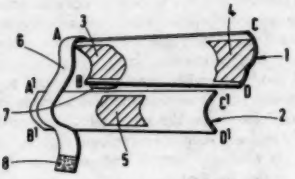
Douglas Wardlaw, Mill of Monquich, Netherly, Stonehaven, United Kingdom

Filed Jul. 29, 1987, Ser. No. 79,091

Claims priority, application United Kingdom, Jul. 31, 1986, 8618651

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—87 R 13 Claims



1. An orthopaedic brace suitable for the treatment of fractures of a lower part of a limb which brace comprises two preformed portions of substantially equal length, one of said portions being larger than the other, said portions together extending substantially around the circumference of the limb, the first one of said portions having two areas of high loading arranged distally and proximally on the portion and the second one of said portions having an area of high loading at or near its centre, said areas of high loading being provided by raised areas on the inside surfaces of said first and second portions, whereby the portions when fitted around the limb and fracture provide three point loading of the limb.

4,796,612

BONE CLAMP AND METHOD

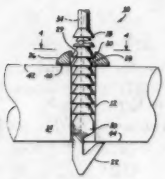
Hewitt W. Reese, 3214 River, Tempe, Ariz. 85282

Filed Aug. 6, 1986, Ser. No. 893,624

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—92 YF 13 Claims



1. A bone clamping apparatus, comprising:

an elongated shaft means for passing through an aperture in the bone, wherein said shaft means has opposed first and second ends;

first bone engagement meas, attached to said shaft means at said first end for engaging a first surface of the bone;

unitary second bone engagement means, separate from said shaft means, and having a central bore for sliding over said shaft means and engaging a second surface of the bone opposite said first surface to form a clamp;

wherein said elongated shaft means has thereon one or more substantially circumferential ring means for permitting said second bone engagement means to move along said shaft toward said first end, but preventing said second bone engagement means from moving back toward said second end, said elongated shaft means further having slot means extending substantially from said second end to said first bone engagement means for receiving a tool for inserting said clamp in said aperture in said bone.

4,796,613

LITHOTRIPSY WORK STATION

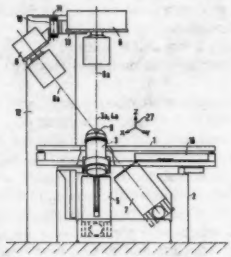
Reiner Heumann, Spardorf; Erich Noske, Weiher, and Manfred Rattner, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,043

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536091; Dec. 6, 1985, 3543265

Int. Cl.[4] A61B 17/22

U.S. Cl. 128—24 A 9 Claims



1. A lithotripsy work station comprising:

a patient support table having a longitudinal axis for selectively positioning a patient thereon with respect to a fixed point in space;

at least one shock wave generator for disintegrating calculi disposed beneath said patient support table, said shock wave generator having a membrane for coupling said shock wave generator to the skin of said patient, and said patient support table having an opening therein through which said shock wave generator can at least partially extend;

means for mounting said shock wave generator for permitting adjustment of the focus of said shock wave generator to said fixed point in space; and

an x-ray examination means for transilluminating said patient at selected angles for locating calculi, said x-ray examination means including two x-ray radiators disposed above said patient support table and each having a central ray, a central ray of one of said radiators being emitted in a direction perpendicular to said patient support table and the central ray of the other radiator being emitted in an oblique direction with respect to said patient support table, with both of said central rays proceeding in a common plane which includes said longitudinal axis of said patient support table and intersecting in said fixed point in space

4,796,614

COLLAPSIBLE INHALATION VALVE

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Kildeer, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

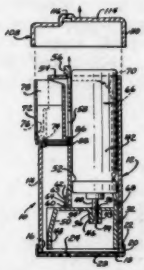
Filed Feb. 26, 1987, Ser. No. 19,212

Int. Cl.[4] A61M 11/00

U.S. Cl. 128—200.14 6 Claims

1. A collapsible inhalation valve for administering asthmatic medication or the like comprising an upright cylindrical air

chamber adapted to be held in the hand and having an upper end and a lower end, means for supporting a pressurized cartridge of medication, means mounting said cartridge supporting means to said air chamber for movement between storage position substantially within said air chamber and raised using position above and substantially out of said air chamber, means for establishing fluid communication from said cartridge into said air chamber with said cartridge supporting means in said raised using position for spraying a measured dose of medication into said air chamber, a one-way valve including a diaphragm adjacent the lower end of said air chamber for admitting air but retaining medication, a mouthpiece adjacent the upper end of said air chamber for receipt in a patient's mouth, said air chamber opening into said mouthpiece to pass medication from said air chamber through said mouthpiece and into the patient upon patient inhalation, and stop means on said cartridge supporting means coacting with said air chamber to stop said cartridge means short of said diaphragm.

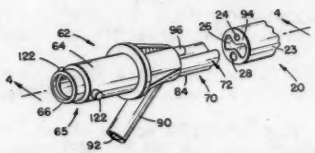


4,796,615

CONNECTOR FOR ESOPHAGEAL PROBE

James K. Bullock, Burbank; L. Arnold Mann, Valencia, and Daniel R. Kuni, Saugus, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 16, 1986, Ser. No. 920,290
Int. Cl.[4] A62B *9/04*
U.S. Cl. 128—202.27 **11 Claims**



1. A quick disconnect connector for use in a system for measuring depth of anesthesia of a patient, the system including a cylindrical female receptacle having a base and a terminal circular edge and a sidewall extending between the base and the edge to thereby define a receiving cavity having a longitudinal axis, the female receptacle having a pair of diametrically opposed bayonet slots formed therein, each slot extending generally parallel to the longitudinal axis for a first distance then curving to extend generally perpendicular to the longitudinal axis for a second distance, the slots extending in the same direction, each to its own terminus; and a resilient gasket received in the cavity adjacent the base; said connector adapted to be joined to multi-lumen tubing having at least a central conduit and a lower conduit, comprising:

a main body having a chamber therein, a longitudinal axis, and a first end terminating at a rim defining an opening into the chamber and having a second end opposite said first end;

a first elongated member integral with said main body and extending away from said second end and having a passageway extending therethrough communicating with the chamber, said first member being generally aligned with the longitudinal axis of said main body and fittingly receivable within the central conduit of the associated multi-lumen tubing;

said first end being a cylindrical male element having radially directed bayonet pins extending in diametrically opposed directions engageable with the mating bayonet slots in the female receptacle such that, with said first end aligned with the cavity in the female receptacle, said first end is inserted therein toward the base and turned about the longitudinal axis as it proceeds until each of said pins reaches its associated terminus, said rim being engaged with said gasket to thereby achieve a fluid tight junction between said connector and said female receptacle;

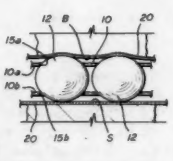
a duct member integral with said main body extending transversely therefrom and having a passage extending therethrough; and a second elongated member integral with said main body and extending away from said second end and having a passageway extending therethrough communicating with the passageway in said duct member, said second elongated member being fittingly receivable in the lower conduit.

4,796,616

MASSAGING DEVICE

Yousef Panahpour, 1980 Post Oak Blvd., Suite 1015, Houston, Tex. 77056

Filed Aug. 28, 1987, Ser. No. 90,955
Int. Cl.[4] A61H *15/00*
U.S. Cl. 128—57 **5 Claims**



1. A massaging apparatus, comprising:

a plurality of elastic spherical massaging balls which are yieldable and compressible from a spherical shape to a substantially elliptical shape upon applying a compressive force thereto;

a carrier for said balls having sides a generally planar first plate and a generally planar second plate;

each of said plates having an opening through said plates with a substantially circular edge for mounting each of said balls between said plates in order to permit rotation of said balls relative to said plates whether in a non-compressed or compressed condition;

the distance between said first plate and said second plate being less than the diameter of each of said balls so that a portion of each of said balls projects externally of each said opening beyond both said first plate and said second plate;

each of said balls when in a non-compressed condition being laterally and longitudinally spaced from each adjacent ball a sufficient distance to enable each of said balls to be compressed to a substantially eliptical shape without contacting the adjacent ball and being rotatable relative to said carrier while so compressed; and

the opening for each of said balls having a diameter which is slightly smaller than the diameter of each ball and large enough so that there is very little frictional contact be-

tween the edge of said opening and the ball when the ball is in the non-compressed condition so as to allow the balls to freely rotate in all directions at all times and so that upon compression of each ball to a substantially elliptical shape, each ball can still be rotated relative to said plates of said carrier.

4,796,617

TRACHEOSTOMY TUBE ASSEMBLY

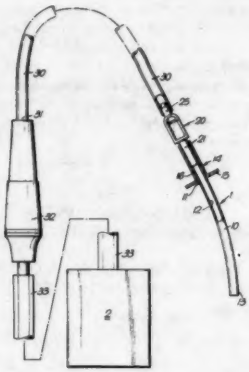
Hugoe R. Matthews, 43 Moor Green Lane, Moseley, Birmingham, and Huw B. J. Fischer, Chestons Cottage, Uphampton, Ombersley, Worcestershire, both of England

Filed Jan. 3, 1985, Ser. No. 688,484

Claims priority, application United Kingdom, Jan. 11, 1984, 8400618

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.25 **2 Claims**



1. A tracheostomy tube assembly comprising a main tube having a patient end and a machine end, the patient end of the main tube being inserted into the trachea of a patient through an incision in the patient's throat, the patient end of said main tube being configured such that gas flow along the trachea around the main tube is substantially unimpeded, and a substantially tubular adaptor that is joined to the machine end of the main tube close to and external of the throat of the patient, the adaptor including: means defining a cavity; a first bore extending from said cavity to said main tube; a high frequency jet tube, one end of said jet tube opening into said cavity and being directed towards said first bore, the cross-sectional area of said jet tube being less than that of said cavity; an aperture that opens into said cavity; and means for selectively completely blocking said aperture; said aperture opening to atmosphere when unblocked such that high-frequency jet-ventilation pulses supplied to said jet tube cause entrainment of air from the aperture towards the patient end of the main tube, the cross-sectional area of the patient end of the main tube being small enough that when said aperture is completely blocked by said blocking means the said high-frequency jet-ventilation pulses are produced at the patient end of the main tube and are operative to entrain gas within the trachea.

4,796,618

BREATHING REGULATOR APPARATUS

Dean R. Garraffa, Garden Grove, Calif., assignor to Undersea Industries, Inc., Rancho Dominguez, Calif.

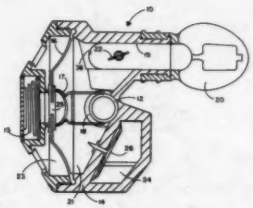
Filed Jan. 21, 1986, Ser. No. 820,845

Int. Cl.[4] A62B *7/04*

U.S. Cl. 128—204.26 **6 Claims**

1. An improved breathing regulator apparatus for use by a scuba diver having a housing; a movable diaphragm extending across one end of said housing to define a breathing chamber; a mouthpiece tube fluidly coupled to said breathing chamber extending from the opposing end of said housing and integrally formed therein; an air inlet fluidically coupled to said breathing chamber and adapted for connection to a pressurized source of air; an air inlet valve means for controlling the air stream from the pressurized source to said mouthpiece tube; and means connecting said valve means to said diaphragm for operating said valve means responsive to a reduction in pressure within the regulator induced by inhalation of air through said mouthpiece tube by the scuba diver during an inhalation portion of a breathing cycle, the improvement comprising:

flow vane means pivotedly mounted within said mouthpiece tube adjacent said breathing chamber having a first positional location for intercepting and directing the air



stream through said mouthpiece tube; said flow vane means creating a venturi effect to assist in the reduction in pressure within said regulator induced by the inhalation, said flow vane means having a second positional location for redirecting at least a predetermined portion of the air stream toward said diaphragm thereby reducing the venturi effect, and

means for manually varying the orientation of said flow vane means between said first and second positional locations to adjust the portion of the air stream being redirected; said means for manually varying said positional location of said flow vane means extending through said mouthpiece tube external of said housing for permitting the scuba diver to adjust said flow vane means during operation of said breathing regulator apparatus.

4,796,619

LUNG-CONTROLLED VALVE FOR RESPIRATOR MASKS HAVING POSITIVE PRESSURES INSIDE THE MASK

Hans-Joachim Walther, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 837,089

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508130

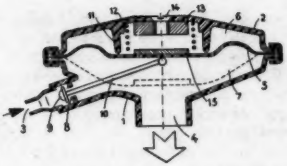
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] A62B *7/04*

U.S. Cl. 128—204.19 **3 Claims**

1. A lung-controlled valve for respirator masks which have a positive interior mask pressure therein fluidically connected to the user's respiratory organs, comprising a valve housing defining an interior valve cavity, a flexible diaphragm connected to said housing and extending across said valve cavity to divide said cavity into an outer chamber on one side of said diaphragm having an outer chamber wall spaced from said diaphragm and a respiration chamber on the other side of said diaphragm having a respiration chamber wall spaced from said diaphragm, an outlet connected into the respiration chamber, a respirator gas inlet connected into said respiration chamber, valve means in said respirator gas inlet having a valve body with a lever portion engaged with said diaphragm and being

movable with said diaphragm to open and close said gas inlet, a magnet secured to said outer chamber wall, a magnetically attractable part arranged on said diaphragm opposite to said magnet, a compression spring disposed between said outer chamber wall and said flexible diaphragm for controlling the



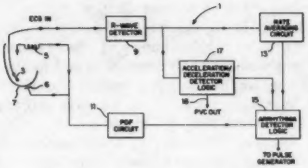
movement of said diaphragm for controlling the pressure in the respirator chamber, and a spacer between said outer chamber wall and said diaphragm holding said magnetically attractable part and said diaphragm against movement in the direction of the magnet, under the influence of said magnet, beyond a minimum spacing from said magnet.

4,796,620

SYSTEM FOR SENSING ABNORMAL HEART ACTIVITY BY MEANS OF HEART RATE ACCELERATION AND DECELERATION DETECTION

Mir Imran, San Francisco, Calif., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed May 13, 1986, Ser. No. 862,785
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—706 **5 Claims**



1. An arrhythmia detection system for an automatic defibrillator/cardioverter capable of sensing heart activity and delivering high-energy electrical pulses to the heart in response to an arrhythmia detection, the system comprising:

ECG input means for receiving an ECG waveform;

R-wave detecting means operatively connected with said ECG input means for detecting the presence of the R-waves;

rate averaging means operatively connected with the R-wave detecting means for determining the average R-wave rate and for providing a rate averaging signal when the average R-wave rate exceeds a predetermined value;

acceleration detector means, operatively connected with said R-wave detecting means, for determining the rate of acceleration of a series of R-waves and for providing a acceleration output signal when the rate of acceleration of the R-waves exceeds a predetermined value;

arrhythmia detection means operatively connected with said rate averaging means and said acceleration detector means for providing an arrhythmia signal to activate a defibrillator/cardioverter pulse generator in response to receipt of the rate averaging signal and the acceleration output signal.

4,796,621

PROTECTIVE SURGICAL FACE MASK

Louis Barle, 109 Fenwood Dr., Old Saybrook, Conn. 06475, and Ron Vliet, 376 Wells Rd., Wethersfield, Conn. 06109

Filed Dec. 9, 1987, Ser. No. 130,301
Int. Cl.[4] A61F 9/00
U.S. Cl. 128—206.23 **11 Claims**

1. A mask for covering the face to prevent invasive entry of fluids, atomized particles and the like into the openings of the mouth, nose and eyes, said mask comprising:

a lower portion of sheet material having means for conforming the shape of the material to cover the mouth and nose of a user and an opening in the region of the eyes at an upper portion of said sheet material including means for covering the eye opening with a transparent plastic sheet material of substantially constant thickness throughout wherein the plastic sheet material is anatomically contoured to extend generally transversely across the brow and substantially from temple to temple and downward from an upper edge and at both sides of the bridge portion of the nose to a region of the face defined by the cheekbone and generally inward toward the fleshy portion of the face and terminating in a lower edge to cover the facial area in the region of the eyes and permit a user to wear spectacles in the normal manner outside the covering means, and

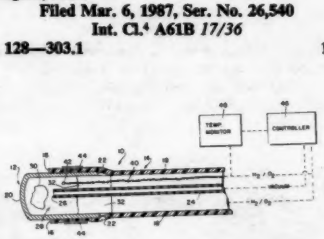
first means secured to the lower portion of the sheet material and second means secured to the anatomically contoured covering in the upper portion of the sheet material for attaching the mask to the head of a user.

4,796,622

CATHETER WITH OXYHYDROGEN CATALYTIC THERMAL TIP

David Y. Lu, Rockville, and Robert L. Bowman, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 6, 1987, Ser. No. 26,540
Int. Cl.[4] A61B 17/36
U.S. Cl. 128—303.1 **15 Claims**



1. A catalytic thermal tip catheter, comprising:

a distal metallic tip end; a catalytic chamber adjacent to and partially enclosed by said metallic tip; a catalyst for initiating an exothermic reaction between two gases, located in said chamber; and elongated catheter body comprising means for the passage of a reactive gas from a remote location to said catalytic chamber; whereby introduction of said reactive gas in said catalytic chamber effects a

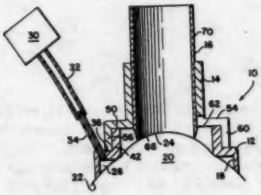
catalytically initiated chemical reaction which produces heat conducted directly to said metallic tip to heat said metallic tip to a temperature of at least 180° C.

4,796,623

CORNEAL VACUUM TREPHINE SYSTEM

Gary N. Krasner, Irvine, and John W. Berkman, Costa Mesa, both of Calif., assignors to The Cooper Companies, Inc., Menlo Park, Calif.

Filed Jul. 20, 1987, Ser. No. 75,842
Int. Cl.[4] A61F *17/32*
U.S. Cl. 128—305 **56 Claims**



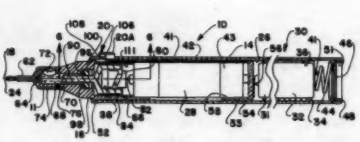
1. A corneal vacuum trephine system comprising:
a suction ring adapted to be positioned on an eye over the cornea,
said suction ring having an annular suction ring surface configured to define an annular suction space when said suction ring is positioned against the eye.
said suction ring defining a suction ring bore,
said annular suction space being positioned outside of and so as to generally not be in fluid communication with said suction ring bore,
a trephine positionable in said suction ring bore and so as to be movable relative to said suction ring for cutting the cornea,
said trephine comprising a generally cylindrical member and a sharp circular corneal cutting edge at the distal end of said cylindrical member for cutting a corneal disk by the rotation of said cylindrical member against the cornea,
a trephine guide means positionable on said suction ring for guiding said trephine therein and for permitting said trephine to be separated from said suction ring when said suction ring is secured to the eye, and
said trephine guide means defining an elongated guide cylinder for guiding said trephine therein.

4,796,624

LASHLINER

Arthur F. Trott, Largo, and Sam R. Marchand, Dunedin, both of Fla., assignors to Concept, Inc., Clearwater, Fla.

Filed Nov. 19, 1986, Ser. No. 932,638
Int. Cl.[4] A61D *1/00*; B43K *5/00*
U.S. Cl. 128—316 **18 Claims**



1. An apparatus for introducing a liquid within a material, comprising:
a body member having an interior cavity;
motor means disposed in said interior cavity of said body member;
an end member secured to said body member;
needle means;
needle guide extending through said end member for slidably mounting said needle means;
reciprocal coupling means interconnecting said motor means and said needle means for reciprocating said needle means relative to said end member upon rotation of said motor means;
said reciprocating needle means being capable of creating a plurality of perforations in the material;
reservoir means in fluid communication with said needle means for retaining the liquid therein and for enabling the liquid to flow along said needle means to enter the plurality of perforations in the material upon reciprocation of said needle means;
said reservoir further including an internal cavity disposed in said end member;
said end member further including a filling aperture communicating with said internal cavity for filling said internal cavity with the liquid; and
a perforatable reservoir membrane for covering said filling aperture to retain the liquid in said internal cavity and for permitting in use piercing by a liquid delivering needle to deliver the liquid to said reservoir and to self-seal upon withdrawal of said liquid delivering needle from said perforatable reservoir membrane.

18. An apparatus for introducing a liquid pigment into tissue, comprising:
a body member having an interior cavity;
motor means disposed in said interior cavity of said body member;
said interior cavity being dimensioned for receiving battery means therein for supplying electrical power to said motor means;
an end member secured to an end of said body member;
needle means;
a tubular member extending through said end member for slidably receiving said needle means therein;
reciprocal coupling means comprising a solid cylindrical cam having a groove formed therein;
a cam follower interconnecting said motor means and said needle means for reciprocating said needle means relative to said end member upon rotation of said motor means;
a cam follower tooth with a first end for engaging said cam groove to reciprocate said cam follower and said needle means upon rotation of said motor;
said cam follower tooth having a second end extending outwardly from said cam follower to be slidably received within a slot defined within said end member such that in use said cam follower is prevented from from rotating within said end member;
said reciprocating needle means being capable of creating a plurality of perforations in the tissue;
reservoir means comprising an internal cavity disposed in said end member and in fluid communication with said needle means for retaining the liquid pigment therein and for enabling the liquid pigment to flow along said needle means to enter the plurality of perforations in the tissue upon reciprocation of said needle means; and
a switch electrically interposed between said motor means and the battery means for controlling the rotation of said motor means.

4,796,625

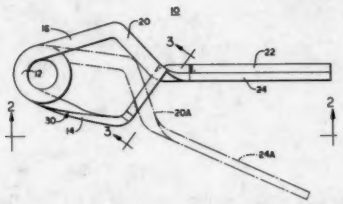
ANEURYSM CLIP

George Kees, Jr., Alexandria, Ky., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Nov. 15, 1982, Ser. No. 441,535
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 **1 Claim**

1. A one-piece aneurysm clip having an elongated flat ribbon body including a central helical section joining first connecting portions, wide sides of the flat ribbon body in the helical sec-

tion being substantially normal to the axis of the helical section, second connecting portions extending from the first connecting portions transversely of the first connecting portions, blade portions extending from the second connecting portions, the blade portions being engageable substantially flatwise, spring action of the helical section urging the blade portions to engaged position, and a guide bar and stop member mounted on one of the second connecting portions and overlying an opposed other of the second connecting portions, the guide bar



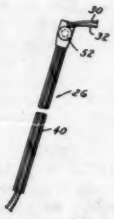
and stop member including a stop portion extending outwardly of said one of the second connecting portions and being engageable by the other of the second connecting portions to limit opening of the clip and a guide bar portion spaced from and substantially parallel to said one of the second connecting portions to hold the blade portions in alignment, there being a 90 degree turn in the ribbon between the helical section and said one of the second connecting portions so that said one of the second connecting portions is in a plane parallel to the axis of the helical section.

4,796,626

TOURNIQUET TUBE

James H. DeVries, Grand Rapids, Mich., assignor to DLP Inc., Grand Rapids, Mich.

Filed Apr. 15, 1987, Ser. No. 38,721
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 R **7 Claims**



1. A suture lumen for securing sutures in a surgical procedure which comprises:

(a) a lumen open at both ends and having a proximal end and a distal end,

(b) a projection at one portion of said lumen adjacent the proximal end independent of the lumen passage having an annular recess to receive sutures wound into said recess, and

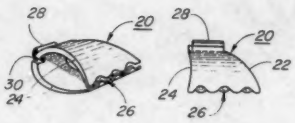
(c) means forming a notch adjacent said projection to frictionally engage suture ends drawn into the notch.

4,796,627

CLIP APPLICATOR AND SPREADABLE CLIPS FOR USE THEREIN

Wilson H. Tucker, Box 265, R.D. 1, Mystic, Conn. 06355

Filed Aug. 26, 1986, Ser. No. 900,383
Int. Cl.[4] A61B *17/08*
U.S. Cl. 128—337 **12 Claims**



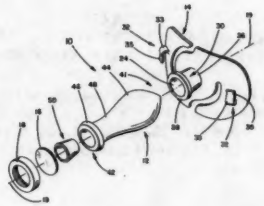
1. In a spreadable surgical clip having a front face and a bight portion, a pair of opposed leg portions extending from the bight portion and terminating at their distal ends in respective bearing lips facing clamping slit in the front face of the clip, the bight portion being narrower than the front face, the improvement comprising that the clip has a front-to-rear narrowing taper which is greater on one lateral side of the clip than on the other.

4,796,628

INFANT PACIFIER

Sanford J. Anderson, 10284 Nottingham Trail, Eden Prairie, Minn. 55344

Filed Jun. 8, 1987, Ser. No. 59,331
Int. Cl.[4] A61J *17/00*
U.S. Cl. 128—360 **17 Claims**



1. An infant feeding and pacifying system comprising:

(a) a gavage container;

(b) a gavage tube connected to the gavage container; and

(c) an infant pacifier comprising:

(i) a nipple; and

(ii) a guard having an inner surface and an outer surface, wherein the nipple is connected to the guard and extends from the inner surfsace thereof, and wherein the guard forms groove means for receiving the gavage feeding tube, whereby the pacifier and the gavage feeding tube can be used simultaneously and whereby the pacifier can be inserted and removed without disturbing the gavage tube.

4,796,629

STIFFENED DILATION BALLOON CATHETER DEVICE

Joseph Grayzel, 262 Fountain Rd., Englewood, N.J. 07631

Filed Jun. 3, 1987, Ser. No. 57,807
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **26 Claims**

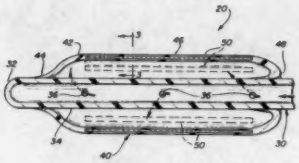
1. A balloon catheter for use in angioplasty and/or valvuloplasty procedures comprising:

a catheter section having a flow passage for pressurized liquid;

an expandable chamber connected to the catheter section having a wall for containing a pressurized liquid;

passage means in said catheter section communicating said flow passage with said expandable chamber;

said expandable chamber having a wall section forming a cylindrical section when expanded;



a plurality of relatively rigid stiffening members peripherally disposed and axially extending along said expandable chamber, said stiffening members connected along the length thereof to the wall of said expandable chamber and movable with the wall of the expandable chamber; and

said stiffening members acting to maintain said cylindrical section to resist localized deformation in the surface of the expandable chamber.

4,796,630

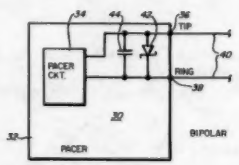
CARDIAC PACEMAKER WITH COMBINED DEFIBRILLATION AND ELECTROSURGERY PROTECTION

Richard C. Regna, Miami, Fla., assignor to Telectronics N.V., Netherlands Antilles

Filed Mar. 23, 1987, Ser. No. 28,753

Int. Cl.[4] A61N *1/00*; H05G *00/00*

U.S. Cl. 128—419 D **10 Claims**



1. A cardiac pacemaker having combined defibrillation and electrosurgery protection which comprises:

an implantable housing;

a pacing circuit located within said housing;

means for attaching a lead to said housing;

a protection circuit located between the pacing circuit and said attaching means, said protection circuit comprising a voltage breakdown device and a capacitor connected across said voltage breakdown device, said capacitor having a value to provide a relatively low impedance with respect to electrosurgery frequencies and a relatively high impedance with respect to cardiac myopotential frequencies, said protection circuit having no series inductor whereby there is no tuned circuit nor is detuning required, thereby alleviating an electromagnetic interference problem that might be caused by using a series inductor.

4,796,631

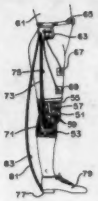
ELECTRICAL MUSCLE STIMULATOR FOR KNEE STABILIZATION

Leon M. Grigoryev, 14 Hunts Mill Rd., Clinton, N.J. 08809

Filed Jun. 11, 1987, Ser. No. 60,660

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—421 **18 Claims**



1. A portable electrical muscle stimulator for knee stabilization in a leg having inadequate neurological and muscular control to obtain normalization of locomotion, which comprises:

(a) a power source means for generating electrical current sufficient to stimulate muscle activation to the leg muscles;

(b) at least one muscle stimulation electrode for attachment to muscles of the leg, said electrode being connected to said power source means;

(c) a control unit for said power source means, having manual on/off means and having two control on/off switches which are activated and deactivated in response to predetermined conditions, a first switch of said two control on/off switches being responsive to knee angle and a second switch, of said two control on/off switches being responsive to heavy heel ground contact, said control unit being inactive unless said on/off means and both of said two control on/off switches are all activated;

(d) knee angle measuring means attachable to a knee and electrically connected to said first switch so as to activate said first switch when the knee angle is equal to or greater than a preset angle and to deactivate said first switch when the knee angle is less than said preset angle; and,

(e) a heel ground contact determining means attachable to a heel of a foot and electrically connected to said second switch so as to activate said second switch when the heel has ground contact with adequate weight on the heel to establish standing, and to deactivate said second switch when the heel does not have ground contact with adequate weight on the heel to establish standing; said stimulator being capable of transmitting electrical pulses to quadriceps through said at least one electrode to simulate the quadriceps sufficiently to assist in the stabilizing musculature of the knee during locomotion.

4,796,632

STANDOFF ADAPTER FOR ULTRASOUND PROBE

Ronald J. Boyd, Sacramento; Wing Law, Gold River, and Gary L. Wilson, Rancho Cordova, all of Calif., assignors to General Electric Company, Milwaukee, Wis.

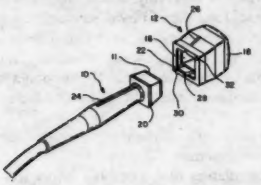
Continuation of Ser. No. 895,342, Aug. 11, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 158,087

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—662.03 **11 Claims**

1. An adapter for an ultrasound probe comprising a first unitary, molded elastic coupler portion and a second unitary, molded elastic receptacle portion, said coupler portion including a first housing with an integral coupling surface on one end of said first housing and an opening on an opposing end of said first housing, said receptacle portion including a second housing with an integral coupling surface on one end of said second housing and an opening on an opposing end of said second

housing, said second housing being inserted through said opening of said first housing and nested within said first housing with said coupling surfaces and said first housing defining a fluid cavity for transmitting ultrasound waves and said second



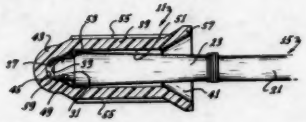
housing further including a vent hole for venting air from said fluid cavity and a filler hole for filling said fluid cavity with fluid, said opening of said second housing receiving a probe head whereby said probe head is positioned within said first and second housings and abutting said fluid cavity.

4,796,633

METHOD AND APPARATUS FOR IN VITRO CALIBRATION OF OXYGEN SATURATION MONITOR

Lori J. Zwirkoski, Tustin, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 25, 1985, Ser. No. 748,485
Int. Cl.[4] A61B *5/00*; G01J *1/02*
U.S. Cl. 128—634 **15 Claims**



1. A calibration reference apparatus for use with a light guide having an end portion which terminates in an end face, said apparatus comprising:

a calibration element having a surface defining a cavity, said cavity having an opening at one end and otherwise being essentially optically closed, said opening being sized to receive the end portion of a light guide;

means for releasably positioning the end portion of a light guide in the cavity with the end face of the light guide spaced from said surface opposite said opening to define a gap whereby a light guide can direct light at least at one wavelength from the end face thereof across the gap and against said surface opposite said opening;

said calibration element having means for returning some of the light at said one wavelength which is directed against said surface opposite said opening;

said means for returning having similar light returning properties as blood; and

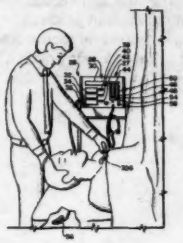
said positioning means and said calibration element being fixed with respect to each other.

4,796,634

METHODS AND APPARATUS FOR MONITORING CARDIAC OUTPUT

Lee L. Huntsman, Bainbridge Island; Richard S. Leard, Issaquah; Gary L. Tarbox, Bainbridge Island; Stephen R. Barnes, Seattle, and Barry D. McLaren, Auburn, all of Wash., assignors to Lawrence Medical Systems, Inc., Camarillo, Calif.

Filed Aug. 9, 1985, Ser. No. 763,992
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—662.01 **21 Claims**



9. A method of determining the cardiac index of a human patient which includes the steps of: computing the cardiac output of the patient by determining the cross-sectional area of the patient's ascending aorta, generating a signal representative of the systolic velocity of the blood flowing through the patient's descending aorta with an ultrasonic probe inserted in the esophagus of the patient, upwardly scaling that signal from a calibration signal representing a relationship between said systolic velocity representative signal and the velocity of the blood flowing through patient's ascending aorta, subjecting said first systolic velocity signal to frequency spectrum analysis to produce a multicomponent velocity profile signal, integrating said velocity profile signal with respect to time to thereby produce a systolic velocity integral, computing stroke volume as a function of said cross-sectional area and said systolic velocity integral, summing the stroke volumes thus determined for n beats of the patient's heart, and dividing the resulting sum by the time spanning said n beats to determine said cardiac output, and dividing the cardiac output of the patient by his body surface area.

4,796,635

MULTIPLE-ECHO, MULTIPLE-VIEW NMR ANGIOGRAPHY

Charles L. Dumoulin, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,592
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 **13 Claims**

1. A method for acquiring a plurality of nuclear magnetic resonance (NMR) angiographic images of flowing material in at least a selected portion of a sample, comprising the steps of:

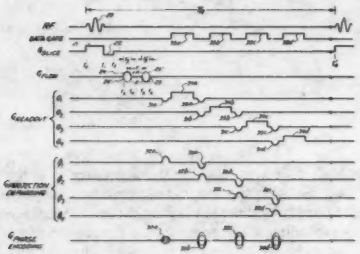
(a) immersing the sample in a main static magnetic field;

(b) nutating, in an initial part of each of a first sequence and a second sequence of a sequential pair of imaging sequences for each of a multiplicity S of regions of said selected sample portion, the spins of all nuclei of a selected species;

(c) applying a pair of alternating-polarity flow-encoding signal pulses in a first magnetic field gradient impressed upon the sample in a first direction selected to establish one axis of each of the NMR angiographic projection images, to cause a resulting NMR response echo signal from the spin of a moving nucleus to differ from the NMR response echo signal resulting from the spin of a substantially stationary nucleus; each of the flow-encoding pulses

in the first sequence of each pair having a polarity flow-encoding pulse in the second sequence of each pair;

(d) acquiring, responsive to a readout magnetic field gradient impressed upon the sample in a second direction, substantially orthogonal to the first direction, and varied to be different in each j-th one, where $1 \leqq j \leqq N$, of a plurality N of response data acquisition time intervals of a sequence, with the second direction being the same in each like-numbered j-th acquisition interval of both sequences of all sequence pairs, a set of data from the NMR response echo signal evoked, from the same sample portion, in each different one of the plurality N of acquisition time intervals of each of the first and sequences; generating a rephasing pulse in the readout gradient prior to each of the N acquisition time intervals in each sequence; generating a rephasing pulse in the readout gradient after each of the



first (N−1) acquisition time intervals in each sequence; and providing each rephasing pulse with substantially the same amplitude as the associated dephasing pulse;

(e) subtracting, for each different j-th one of the N different acquisition time intervals, the data acquired in the j-th acquisition interval of one sequence from the data acquired in the like-numbered j-th acquisition interval of the other sequence of each sequence pair, to generate a j-th one of N different-pair difference sets from which response data obtained from stationary nuclei has been substantially removed; and

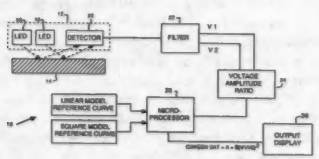
(f) generating N different angiographic images, with the j-th image being generated from all of the j-th pair difference sets and with each j-th image lying in a plane having a preselected relationship with respect to the first direction and the different second direction for that j-th image.

4,796,636

NONINVASIVE REFLECTANCE OXIMETER

Ronald L. Branstetter, and Reuben W. Edgar, Jr., both of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Komaki, Japan

Filed Sep. 10, 1987, Ser. No. 95,125
Int. Cl.[4] G01N *33/48*
U.S. Cl. 128—633 **18 Claims**



1. A blood oxygen saturation monitoring system comprising:

a first source of electromagnetic radiation at a first wavelength;

a second source of electromagnetic radiation at a second wavelength;

means for positioning said first and second sources of electromagnetic radiation to illuminate a sample of blood;

sensing means for receiving electromagnetic radiation reflected by said sample of blood, said reflected electromagnetic radiation comprising an AC component and a DC component, said sensing means producing an output signal corresponding only to the AC components of the reflected portions of said first and second electromagnetic radiation;

means for producing a quotient of squared values of said AC voltage components;

means for calculating blood oxygen saturation by correlating said quotient of said squared AC components with an oxygen saturation reference curve, said reference curve being uniquely representative of the blood oxygen saturation characteristics of a particular individual.

4,796,637

RADIOPAQUE MARKER FOR STEREOTAXIC CATHETER

Frank Mascuch, Watchung, and Arthur Winter, Short Hills, both of N.J., assignors to Victory Engineering Company, Springfield, N.J.

Filed Jun. 17, 1987, Ser. No. 62,967
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—658 **5 Claims**

1. A radiopaque marking system for a cathether, wherein said catheter includes at least one lumen parallel to an axis thereof, comprising:

said at least one lumen including a first length;

a staff in said at least one lumen;

said staff being a radiotransparent material;

at least first and second bands of a radiopaque material axially spaced a predetermined distance apart on said staff;

said staff including a second length;

said second length being substantially equal to said first length, whereby said staff is disposed in a known position within said lumen;

said at least first and second bands having a known positional relationship along a length of said staff, whereby said at least first and second bands also have a known positional relationship along a length of said catheter; and

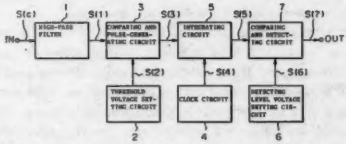
means for sealing said staff within said lumen, whereby said radiopaque material is isolated from an exterior of said catheter.

4,796,638

ARTIFACT DETECTING APPARATUS IN THE MEASUREMENT OF A BIOLOGICAL SIGNAL

Minoru Sasaki, Yokohama, Japan, assignor to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 876,859, May 22, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 169,144
Claims priority, application Japan, Sep. 28, 1984, 59-201897
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—696 4 Claims



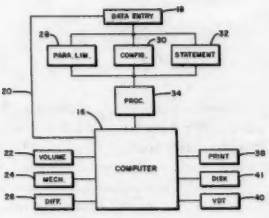
1. An artifact detecting apparatus comprising:
a filter for passing high frequency components approximate to or the same as the frequency components of a QRS wave complex signal contained in a electrocardiogram signal;
a first comparing means for comparing each of the amplitude voltages of said high frequency components with a first predetermined level and for generating a pulse or pulses when at least one voltage of said amplitude voltages exceeds said predetermined level;
pulse-counting means for counting a pulse or pulses output from said first comparing means within a predetermined time interval; and
a second comparing means for comparing a level of a signal output from said pulse-counting means with a second predetermined level and for output in a signal indicating a detection of an artifact when said level exceeds said second predetermined level.

4,796,639

PULMONARY DIAGNOSTIC SYSTEM

Michael G. Snow, North St. Paul; William R. Tyler, St. Paul; Sung-Peng Hsu, Eagan, all of Minn., and Robert J. Fallat, San Rafael, Calif., assignors to Medical Graphics Corporation, St. Paul, Minn.

Filed Nov. 5, 1987, Ser. No. 117,482
Int. Cl.[4] A61R 5/08; G06F 15/42
U.S. Cl. 128—719 16 Claims



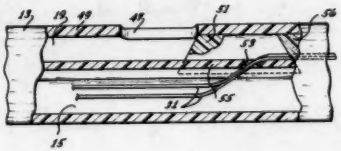
1. A pulmonary diagnostic apparatus, including:
a first electronic data storage means, and a plurality of expected values stored in said first data storage means, each expected value representing a predicted normal level for a pulmonary function;
a first data input means for entering a plurality of value ranges into said first data storage means, each of said ranges corresponding to and encompassing one of said expected values, said first data input means including user operable range input means for adjustably determining the ranges corresponding to each expected value whereby each said range represents a pulmonary function at a level within a normal range as determined by the user;
a second data input means for entering a plurality of boundary values into said first data storage means, said boundary values being arranged in sets of consecutively increasing value, each set corresponding to one of said ranges and determining, with respect to its corresponding range, increasing degrees of departure from said range, said second data input means including user operable boundary input means for adjustably determining said boundary values, thereby to determine the degrees of departure corresponding to each range that represent a pulmonary function at increasingly abnormal levels as determined by the user;
a pulmonary function testing means for measuring a plurality of pulmonary functions and providing a plurality of performance values to said first data storage means, each performance value based upon a measured pulmonary function and corresponding to one of said expected values; and
a processing means operatively associated with said first data storage means for comparing each of said performance values with its corresponding one of said value ranges and generating a first output indicating whether or not said performance value is within said corresponding range, said processing means further comparing each of said performance values lying outside of its corresponding range with its corresponding one of said sets of boundary values and generating a second output indicating a degree of departure from the corresponding range.

4,796,640

APPARATUS WITH FAST RESPONSE THERMISTOR

William E. Webler, Santa Ana, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 13, 1984, Ser. No. 570,619
Int. Cl.[4] H61B 5/02
U.S. Cl. 128—736 19 Claims



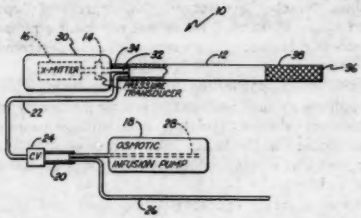
1. An apparatus for measuring the temperature of a fluid within a living body, said apparatus comprising:
an elongated tube sized to be received within a vein or an artery and having proximal and distal ends, a peripheral wall, at least one lumen extending longitudinally within the tube and an opening in the peripheral wall which extends from the lumen to the exterior of the tube;
a thermistor;
a thermistor mounting body in said lumen adjacent said opening at least partially defining a cavity at said opening, said cavity opening radially outwardly; and
said thermistor being partially within said mounting body and projecting radially outwardly of the mounting body into said cavity with the thermistor being spaced from the wall of the cavity over a major area thereof whereby the portion of the thermistor which projects into the cavity is in good heat transfer relationship to the fluid within the body.

4,796,641

DEVICE AND METHOD FOR CHRONIC IN-VIVO MEASUREMENT OF INTERNAL BODY PRESSURE

Perry A. Mills, Roseville, and Brian P. Brockway, Minneapolis, both of Minn., assignors to Data Sciences, Inc., Minneapolis, Minn.

Filed Jul. 6, 1987, Ser. No. 69,728
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—748 **11 Claims**



1. An inplantable device for sensing an internal body pressure of an animal, the device comprising:

implantable catheter means having proximal and distal ends, the distal end for placement at a position within the animal at which the internal body pressure is to be sensed;

implantable pressure sensing means connected to the proximal end of the catheter means for providing a signal which is a function of the internal body pressure;

implantable osmotic infusion pump means connected to the proximal end of the catheter means for supplying does of an antithrombogenic solution to the distal end; and

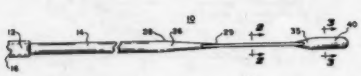
means associated with the osmotic infusion pump means for preventing body fluid from entering the distal end of the catheter means.

4,796,642

PACING LEAD STYLET

Donald L. Harris, Key Largo, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Filed Dec. 28, 1987, Ser. No. 138,434
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—772 **19 Claims**



1. A pacing lead stylet for insertion into a pervenous pacing lead for facilitating insertion of the lead into a patient, the pervenous pacing lead including at least one helical coil in an insulating sheath surrounding a lumen, the lumen being open at a proximal end of the pacing lead and extending to a distal end of the pacing lead where it is generally closed by a pacing lead electrode assembly, said stylet comprising:

a proximal end adapted for manipulation;

a distal end;

a stylet wire connected to said proximal end and extending in distal direction from the proximal end to said distal end and having an axial length sufficient to nearly contact the pacing lead electrode assembly with said stylet distal end, when said stylet wire is fully inserted into the lumen, said stylet wire having a generally constant stylet cross sectional area;

a decreasing taper connected to said stylet wire and extending in a distal direction away from the wire distal end for a decreasing taper distance, said decreasing taper having a decreasing cross section which is reduced from the stylet cross sectional area to a decreased cross sectional area at a decreasing taper distal end of said decreasing taper;

a flat connected to said decreasing taper and extending in a distal direction away from the decreasing taper distal end for a flat distance to a flat distal end, said flat having a cross section which has a maximum extent and a minimum extent;

an increasing taper connected to said flat and extending in a distal direction away from said flat distal end for an increasing taper distance, said increasing taper having an increasing cross section from the minimum extent of the flat to the stylet cross section area; and

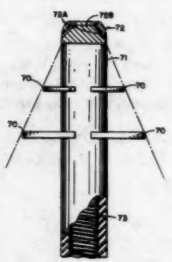
a tip at said stylet distal end connected to said increasing taper extending in a distal direction away from said increasing taper for a predetermined distance, said tip having a generally constant tip cross section area except at a tip distal end which is hemispherical, has a maximum hemispherical cross section area nearly equal to the tip cross section area, and has a hemispherical radius of curvature larger than half a maximum tip cross section.

4,796,643

MEDICAL ELECTRODE LEADS

Akira Nakazawa, Balmain, and Zoran Milijasevic, Sydney, both of Australia, assignors to Telectronics N.V., Curacao, Australia

Filed Sep. 30, 1986, Ser. No. 913,512
Int. Cl.[4] A61N 1/05
U.S. Cl. 128—785 **12 Claims**



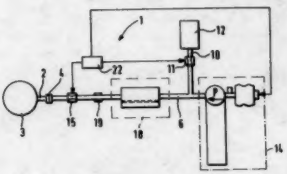
1. An electrode lead for engaging trabeculae having a lead body with an exposed conductive distal tip in a conductive shank supporting the distal tip, said conductive shank having a proximal end, there being an electrical conductor coupled to the proximal end of said shank, insulating means for insulating said shank and the conductor, said insulating means including molded anchoring means, said molded anchoring means comprising at least two rows of loop means having substantially parallel upper and lower surfaces within substantially parallel planes substantially perpendicular to the longitudinal axis of the lead body, the rows of loop means being spaced apart for independent motion a sufficient distance to allow trabeculae to be temporarily entrapped perpendicular to the longitudinal axis of the lead body, said loop means being sufficiently rigid to hold the trabeculae frictionally in place yet sufficiently flexible to be adapted to fold back against the lead body when being passed through a lead introducer and into the heart without tearing the loop means.

4,796,644

APPARATUS FOR INFUSION AND REMOVAL OF SAMPLES OF BLOOD AND OTHER BODY FLUIDS

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 884,128
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524824
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—760 10 Claims



1. Apparatus for taking samples of body fluids from a living body, said apparatus comprising:

a single needle means to connect with a living body for withdrawing body fluids from the living body;

a first valve (15);

a second valve (11);

conduit means coupled at least to said first valve, to said second valve and to said needle means for carrying fluid between said first valve, said second valve and said needle means;

a reciprocating pump (14);

control means coupled at least to said first valve and to said second valve for alternately switching said first valve and said second valve open and closed to control said reciprocating pump in an infusion mode and a removal mode;

an infusion fluid supply (12) coupled to said second valve; and

means (18) for extracting samples of the body fluid from said conduit means;

said second valve disposed between said infusion fluid supply and said pump for controlling fluid access between said infusion fluid supply and said pump;

said first valve being disposed between said pump and said needle means for controlling body fluid access between said pump and the body;

said samples extracting means being disposed between said pump and said needle means for taking samples at least of body fluids from the body;

the filling volume of said pump (14) being substantially greater than the filling volume of the the conduit means.

4,796,645

CYLINDER FOR COMBINE

George J. Kuchar, 939 Charles, P.O. Box 595, Carlinville, Ill. 62626

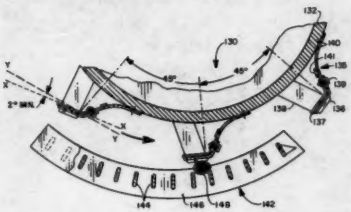
Filed Oct. 13, 1987, Ser. No. 107,556
Int. Cl.[4] A01F 12/18
U.S. Cl. 130—27 HA 15 Claims

1. For use with a concave member in a combine for separating grain from the leafy portion of a plant, a cylinder comprising:

a cylindrical-shaped member adapted for rotational displacement about a longitudinal axis thereof and positioned adjacent to the concave member;

a plurality of linear, elongated bars affixed in a spaced manner about the circumference of said cylindrical-shaped member and extending substantially the entire length thereof, wherein each adjacent pair of bars includes a leading and a trailing bar relative to the direction of rotation of said cylindrical-shaped member; and

a plurality of filler plates extending substantially the entire length of said cylindrical-shaped member, wherein each of said filler plates is disposed between adjacent bars and is attached to and continuous with its associated trailing bar



and extends toward its associated leading bar so as to leave a gap between it and its associated leading bar, and wherein each of said filler plates includes a concave outer portion adapted to receive, engage and transport the grain between said cylindrical-shaped member and the concave member.

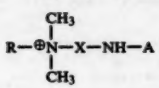
4,796,646

COMPOSITION AND PROCESS FOR TREATING KERATINIC SUBSTANCES WITH AT LEAST ONE ANIONIC POLYMER AND AT LEAST ONE QUATERNIZED PROTEIN

Jean F. Grollier, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Filed Oct. 26, 1984, Ser. No. 665,386
Claims priority, application Luxembourg, Oct. 28, 1983, 85067
Int. Cl.[4] A45D 7/00; A61K 7/06, 7/08, 7/11, 7/13, 7/135, 9/12
U.S. Cl. 132—202 24 Claims

1. Composition for the cosmetic treatment of hair, skin or nails which comprises, in a cosmetically acceptable medium which is suitable for application on said hair, skin or nails, a strongly cationic quaternised protein and an anionic polymer other than homopolymers of acrylic acid crosslinked with a polyfunctional agent, said anionic polymer having a molecular weight of between 500 and 5,000,000 and having a large number of sulphonic, carboxylic, or phosphoric groups, said strongly cationic quaternised protein corresponding to the formula:



(I)

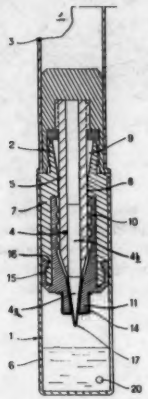
in which A denotes a protein residue derived from hydrolysates of collagen protein, R denotes a lyophilic group containing up to 30 carbon atoms, and X denotes an alkylene group containing from 1 to 6 carbon atoms, said strongly cationic quaternised protein and said anionic polymer being present in concentrations between 0.01 and 10% by weight.

4,796,647

APPLICATOR UNIT FOR A LIQUID, PASTY OR PULVERULENT PRODUCT

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 2, 1987, Ser. No. 92,214
Claims priority, application France, Sep. 15, 1986, 86 12841
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—320 **10 Claims**



1. An applicator unit for a liquid, pasty or pulverulent product such as a cosmetic product, said unit comprising a bottle adopted to contain the product and provided with a threaded neck, a cap receivable on the said bottle to close the same, there being provided interengaging screwthread means on the said neck and in said cap, a stem carried by said cap, an applicator disposed at the end of said stem, and a wiper device in said bottle adapted to be traversed by the applicator upon insertion of the applicator into and withdrawal of the applicator from the bottle, said wiper device comprising a first portion disposed within the bottle at the base of the neck and a second portion that has a smaller diameter than the first portion and extends from the lower end of the said first portion, a first bore being defined within the said first portion, said first bore having a wall formed as a spiral with a thread in the opposite direction to the direction of rotation required for unscrewing the cap, a second bore being defined in said second portion to extend the first bore coaxially and to pass through the end of the second portion, the second bore having, an internal wall and the second element having an external wall and a fibrous coating at least partly covering said internal and external walls.

4,796,648

ERGONOMIC CANE HAVING OVAL, TAPERED SHORT HANDLE AND TRIANGULAR SHANK FOR EASIER CONTROL WITH MORE COMFORTABLE GRIP

Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Filed Mar. 26, 1987, Ser. No. 30,120
Int. Cl.[4] A45B *1/00*
U.S. Cl. 138—65 **9 Claims**

1. An ergonomic cane, comprising:
an elongated shank having a lower end and an upper end,
a handle grip attached to said upper end of said shank,
the portion of said shank which extends at least part way down from and adjacent to said handle grip having a triangular shape with three sides,
said handle grip extending generally normal to said shank and out from said shank about 70 to 80 millimeters so as to be about two thirds the width of an adult human hand and having a free end at the part thereof distal from said shank,
said handle grip having a generally oval cross section which increases in area from the free end of said handle grip to the portion of said handle grip which joins said shank, the height of said handle grip measured parallel to and adjacent said shank being at least twice the height thereof at said free end, such that said handle grip has a larger cross section adjacent said shank than at said free end thereof,
the lower side of said handle grip which is adjacent said shank extending from said shank at a relatively large obtuse angle with said shank,
the upper side of said handle grip which is adjacent said shank extending from said shank at a relatively small obtuse angle with said shank,

the part of said lower side of said handle grip beyond said part which is adjacent said shank curving from said relatively large obtuse angle with said shank to a generally normal angle to said shank,
said handle grip having a plurality but no more than three generally parallel finger grooves adjacent and extending up from said lower side thereof,
whereby said handle grip can be grasped with the thumb and first three fingers of a hand in a very comfortable manner due to the oval shape and increasing size of said handle grip and the index finger and end of the thumb can be comfortably rested on a respective two of the three sides of said shank to help control and direct said cane with precision.

4,796,649

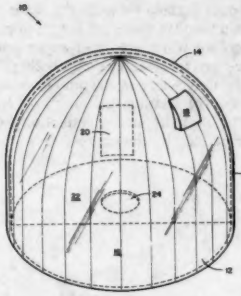
ICE FISHING SHELTER

James E. Tolomay, P.O. Box 452, North Bend, Pa. 17760

Filed Sep. 16, 1987, Ser. No. 97,149
Int. Cl.[4] E04H *15/18*
U.S. Cl. 135—102 **1 Claim**

1. A new and improved igloo shaped ice fishing shelter, comprising:
a first curved hollow molded shell half having a first arcuate peripheral flange;
a second curved hollow molded shell half having a second arcuate peripheral flange;
said first and second peripheral flanges having cooperating VELCRO fastening strips, whereby said first and second shell halves may be assembled to form an igloo shaped ice fishing shelter;
a semicircular floor integrally molded on said first shell half;
said second shell half having an open bottom portion;
a hooded ventilation opening formed in said first shell half;
an arcuate hinged door having curvature in two perpendicular directions formed in said second shell half;

said first and second shell halves formed from reinforced fiberglass; and



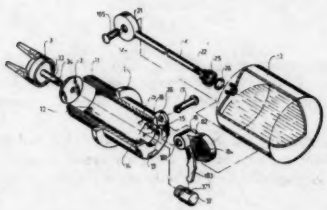
said first and second shell halves provided with a layer of insulation.

4,796,650

STRUCTURE FOR A FLOAT VALVE ASSEMBLY

Bling-Yih Hwang, 89, LinYuan South Road, LinYuan Shian, Kaohsiung Hsien, Taiwan

Filed Dec. 1, 1987, Ser. No. 127,263
Int. Cl.[4] F16K *31/26, 33/00*
U.S. Cl. 137—443 4 Claims



1. A float valve assembly comprising:

a valve body comprising an elongated enclosed tube having an upstream end and a downstream end, and being of generally cylindrical cross-section between said ends, the upstream end of the tube having means for connection to a water supply, the downstream end of the tube having a shoulder so as to define an outlet opening directly at said end of reduced cross-section relative to the internal cross-section of the tube, said shoulder including a circular edge which extends back into the elongated tube to form a valve seat of the outlet opening directly at said end thereof said valve body having ears directly on the downstream end and being adjacent to said outlet valve seat said ears having openings therethrough and a pin inserted therethrough to unite the valve body with a moving member,

said moving member having an axis hole therethrough for also receiving said pin, said moving member also engaging and removably secured to a float rod such that the moving member and the float rod pivot together about the pin axis, and said moving member also having a foot extending downwardly and inserted through an opening in a cap,

a resisting disc within the elongated tube of the valve body, said disc provided with an axially extending post which is united to a central opening of said cap, said resisting disc also having attached thereto said anti-leak gasket which is movable against the said protruding edge of the outlet to close the same,

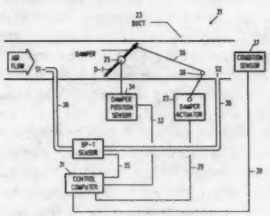
wherein when the float is raised up by the water surface to a certain level, the float rod turns up with the pin passing through the axis hole of the moving member as the axis, causing the foot of the moving member to pull the cap outward, in turn pulling outward the resisting disc together with the anti-leak gasket to urge them against the inwardly protruding edge of the outlet to stop the water flow, with the aid of the water pressure acting against the resisting disc, and wherein when the flow has moved down as the water surface is lowered, the float rod turns down with the said pin as the axis, causing interrelated movement of the said foot of the moving member, the cap, the resisting disc and the anti-leak gasket to open the outlet.

4,796,651

VARIABLE GAS VOLUME FLOW MEASURING AND CONTROL METHODS AND APPARATUS

LeRoy D. Ginn, 15247 Laverne Ct.; LeRoyce S. Ginn, 1749 Kappa Ave., both of San Leandro, Calif. 94579, and Karen B. Schneider, Berkeley, Calif., assignors to LeRoy D. Ginn and LeRoyce S. Ginn, both of San Leandro, Calif.

Filed Mar. 30, 1988, Ser. No. 175,234
Int. Cl.[4] G05D *7/00*
U.S. Cl. 137—8 25 Claims



1. A method of measuring gas flow volume in a system of the kind in which the amount of gas flowing in a duct can vary in response to the variation of area of a variable area orifice in the duct and/or in response to changes in the total pressure of the gas upstream of said orifice and wherein the total pressure upstream of the orifice is referenced to the static pressure downstream of the orifice, said method comprising,

sensing the total pressure upstream of said orifice,

sensing the static pressure downstream of said orifice,

sensing a condition which is representative of the differential pressure between said total pressure upstream of the orifice and said static pressure downstream of the orifice,

producing a first signal corresponding to said sensed condition representative of the differential pressure,

producing a second signal corresponding to the area of the opening in the orifice,

supplying said first and second signals to a gas flow volume database correlated to the sensors and the orifice in the duct, and

reading out from the database the gas flow volume occurring in the duct at the first and second signals.

4,796,652

PRESSURE REGULATOR FOR HYDRAULICALLY CONTROLLED MACHINE TOOLS

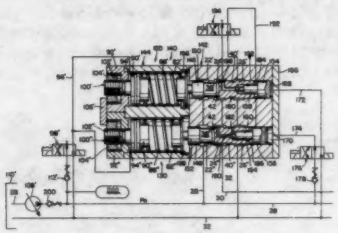
Dietmar F. Hafla, Hohengehren, Fed. Rep. of Germany, assignor to Index-Werke Komm.-Ges. Hahn & Tessky, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,220

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625222

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—116.3 32 Claims



1. A pressure regulator for hydraulically controlled machine tools comprising:

a first directly controlled three-way pressure-regulating valve with a housing including an inflow, an outflow and a pressure port for a hydraulic fluid, and with a control spool mounted therein which is movable back and forth between a first position connecting the inflow with the pressure port, a second position closing the pressure port and a third position connecting the pressure port with the outflow, with a constant pressure being settable at the pressure port, on the one hand, by a force being applied to the control spool by a biased elastic element in the direction of the position connecting the inflow with the pressure port, and, on the other hand, by the control spool having a first surface to which hydraulic fluid under the pressure at the pressure port is applied, by means of which a force counteracting the force of the elastic element acts upon the control spool, the control spool provided with a second surface to which the hydraulic fluid under the pressure at the pressure port can be applied by means of an externally controllable valve and, when applied, results in an additional force acting upon the control spool in the direction opposite to the force of the elastic element.

4,796,653

METHOD OF ENHANCING RESIDUAL COMPRESSIVE STRESS IN DOUBLE METALLIC TUBES

Masahiro Kobayashi, Ebina; Akitake Matsushita, Yokosuka; Hitoshi Nakamura; Shinji Tanaka, both of Yokohama, and Shuji Furuya, Yokohama, all of Japan, assignors to Toshiba Corporation, Kawasaki and Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, both of, Japan

Filed May 28, 1987, Ser. No. 54,895

Claims priority, application Japan, May 30, 1986, 61-125504

Int. Cl.[4] F16K *49/00*; C21D *9/52*

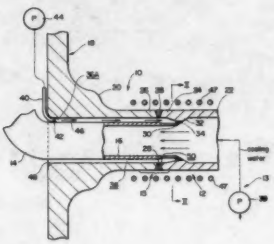
U.S. Cl. 137—341 2 Claims

1. A method of enhancing residual compressive stress in horizontal double metallic pipe constructed of an outer pipe made of an austenitic stainless steel which comprises the main pipe of a boiling water reactor pressure vessel with the main pipe including a nozzle and a safe-end welded coaxially to the nozzle through a first weld joint, and an inner pipe fitted into the outer pipe which is a thermal sleeve welded at one end thereof to the inner face of the main pipe through a second welded joint, said main pipe having been induction heated near said first and second welded joints to produce residual compressive stress in the first and second welded joints, comprising the steps of:

(a) introducing cooling water into both the inner pipe and the annular space defined between the inner pipe and the outer pipe, said annular space having an upper portion;

(b) injecting cooling water into said upper portion of the annular space to form a partial cooling water flow through the cooling water in the annular space;

(c) during the step (b), heating the outer pipe from the outside thereof by high frequency induction heating for a time period τ defined by the expression:



$$\tau \geqq 0.7t^2/a$$

wherein t is the wall thickness in mm of the outer pipe, and a is the temperature conductivity in mm^2 of the outer pipe, to generate a temperature difference between the inner and outer faces thereof to such a degree that a thermal stress larger than a yield point is produced in the outer pipe, said temperature difference being defined by the expression:

$$\Delta T \geqq \frac{4\sigma_y(1-\nu)}{E\alpha}$$

wherein σ_y, ν, E, and α are material yield strength in kg/km^2, Poisson's ratio, Young's modulus in kg/mm^2 and the thermal expansion coefficient in mm/°C., respectively; and

(d) then, stopping the heating of the outer pipe and allowing the outer pipe to stand, whereby residual compressive stress is provided to a radially inner portion of the outer pipe.

4,796,654

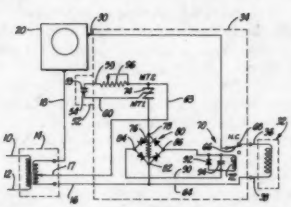
SOIL MOISTURE CONTROL SYSTEM AND METHOD

Bobby R. Simpson, 10072 Trask Blvd., Garden Grove, Calif. 92643

Continuation-in-part of Ser. No. 852,323, Apr. 15, 1986, Pat. No. 4,718,446. This application Jan. 11, 1988, Ser. No. 141,946

Int. Cl.[4] A01G *25/16*

U.S. Cl. 137—78.3 12 Claims



1. A soil moisture control system comprising:

an alternating current source for supplying alternating current;

a switch and a magnetic coil serially connected to said alternating current source, said magnetic coil being for connection to an irrigation water valve so as to control the opening and closing of the water valve;

a soil moisture sensor having first and second spaced electrically conductive graphite rods forming probes for sensing the moisture in soil between said probes, first and second resilient metal springs wrapped around the cut into said first and second graphite rod probes, respectively, said first and second metal springs being connected to said alternating current source so that alternating current passes between said probes when said sensor is immersed in moist soil, said sensor being connected to control said switch; and

including a gate circuit connected to said switch for controlling said switch and said soil moisture sensor being connected to said gate circuit so that said switch changes states when said sensor detects a predetermined amount of moisture in the soil between said probes so that said soil moisture control system inhibits delivery of irrigation water to the soil when soil moisture is adequate.

4,796,655

FLUID CONTROL DEVICES

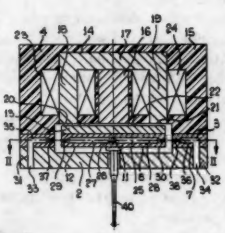
Dennis W. Parker, Cheltenham, and David F. Lakin, Churchdown, both of England, assignors to Dowty Hydraulic Units Limited, Cheltenham, England

Filed Sep. 3, 1987, Ser. No. 92,581

Claims priority, application United Kingdom, Jun. 9, 1987, 8721532

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—83 **11 Claims**



1. A fluid control device comprising a pivotable member having a planar major face and mounted so as to be pivotable about an axis parallel to the major face, the pivotable member including a first layer of non-magnetizable material having a fluid jet channel which directs a fluid jet parallel to the major face and transverse to the pivot axis at a position remote from the pivot axis and a second layer of magnetizable material, a receiving member defining a fluid receiving channel which is positioned so as to receive the fluid jet, and electromagnetic means selectively operable on said magnetizable material to pivot the pivotable member about the pivot axis so as to alter the position of the fluid jet channel relative to the fluid receiving channel and thereby vary the quantity of fluid received by the fluid receiving channel.

4,796,656

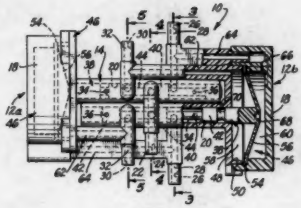
METHOD AND APPARATUS FOR CAUSING A SERIES OF MECHANICAL ACTIONS

Robert E. Phillips, 12217 Iredell St., Studio City, Calif. 91601, and Ben A. Otsap, 7661 Airport Blvd., Los Angeles, Calif. 90045

Filed Feb. 20, 1987, Ser. No. 17,324

Int. Cl.[4] F16K *31/365*; A47C *27/10*

U.S. Cl. 137—106 **23 Claims**



1. An apparatus for sequentially performing a repetitive series of mechanical actions, said apparatus including a series of independently operable mechanical means for providing a physical movement in response to a change in fluid pressure applied to it, each of said mechanical means having an inlet to receive fluid to be used in operating said apparatus, said apparatus also including regulating means for causing sequential changes in the fluid applied to all of said mechanical means in which the improvement comprises:

said regulating means comprising a series of feedback valve means for controlling fluid flow so as to operate said mechanical means, each of said valve means having an inlet and two separate outlets and a pressure differential responsive actuating means, including two compartments and a moveable member separating said compartments, each of said outlets on each of said valve means being connected to the inlet of one of said mechanical means and to a compartment of the actuating means of another of said valve means, none of said outlets being connected to the same mechanical means and the same compartment to which another of said outlets is connected,

said outlets, said mechanical means and said compartments being connected so that an operating cyle is commenced by supplying a fluid through one of said inlets and one of said outlets of one of said valve means to one of said mechanical means so as to cause a mechanical movement and to a compartment of another of said valve means so as to create a pressure differential between it and the other compartment in said other valve means so that such differential causes movement of the movable member separating such compartments, so as to connect a different outlet of the other valve means to the inlet thereof so as to cause a corresponding mechanical movement in the mechanical means connected to it and to initiate another corresponding action of a valve means.

4,796,657

ZONE SELECTOR AND LOCKING MECHANISM FOR SEQUENCING VALVE

Joseph R. Baker, 73 Fairview East, Tequesta, Fla. 33469

Continuation-in-part of Ser. No. 52,267, May 21, 1987, abandoned. This application May 2, 1988, Ser. No. 189,029

Int. Cl.[4] F16K *21/00*

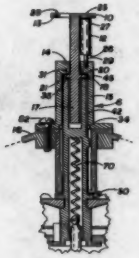
U.S. Cl. 137—119 **19 Claims**

1. In an automatic sprinkling valve of the type having a housing, an inlet and a plurality of outlets in said housing, a movable valve member constructed to sequentially connect the inlet with each of the outlets, a mechanism responsive to sequential increases and decreases in pressure at the inlet for

moving said valve member to sequentially connect the inlet with each of said outlets, the improvement comprising:

(a) manual control means for engaging said mechanism for manually moving said valve to any selected position so that the next pressure increase will connect the inlet to a selected outlet, said manual control means having a first, inactive position in which the operation of said valve is unaffected by said manual control means and said operation of said valve does not affect said manual control means and a second, active position in which the operation of said valve is prevented from sequentially connecting the inlet with each of said outlets and the inlet is connected to a selected outlet and that connection is unchanged by water pressure changes; and

(b) locking means for selectively locking said manual control means in either said first position or said second position.

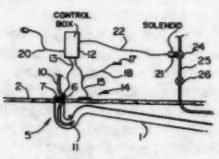


4,796,658

APPARATUS FOR DETECTING BASEMENT WATER

Roderick Caple, 916 Canford Cres., S.W., Calgary, Alberta, Canada T2W 1L2

Filed Jul. 1, 1987, Ser. No. 68,385
Claims priority, application Canada, Jul. 24, 1986, 514610
Int. Cl.[4] F16K *31/02*; H01H *29/04*
U.S. Cl. 137—312 **15 Claims**



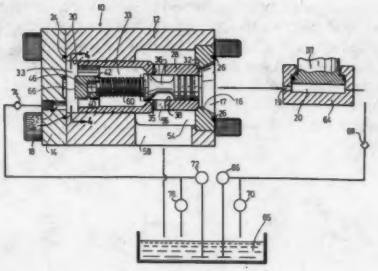
15. In a building having a below-grade basement floor, a floor drain in the basement floor leading to an exterior waste water disposal means, a generally U-shaped trap disposed below said floor drain, and a water supply line for supplying water to the building, apparatus for monitoring the liquid level in the basement floor drain of the building comprising cover means for closing the top of the drain, a tubular casing extending through the cover means into the drain, said tubular casing having means for venting any trapped air above the rising liquid level, said tubular casing having an open lower end for admitting liquid, first sensor means extending downwardly into said casing to a predetermined level above said U-shaped trap so as to be contacted by liquid upon rising in said casing to said predetermined level, said casing further including an open ended extension member extending downwardly in the drain beyond the low point of said trap such that the lower inlet end of the casing is above the low point of said trap to minimize the possibility of bubbles entering said open end and forming a foam in said casing which might give a false signal to said sensor means, and control means connected to said sensor means for shutting off the water supply to the building when the liquid level rises above said predetermined level.

4,796,659

HIGH RESPONSE UNLOADING VALVE

George F. Lehmann, 155 Gunn Avenue, Cambridge, Ontario, 2Z5, Canada

Filed Dec. 22, 1987, Ser. No. 136,703
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—492 **17 Claims**



1. A fast relief valve comprising: a housing having a pressure setting chamber and a pressure sensing chamber;

a trigger valve seat;

a low inertia trigger valve element extending between said pressure setting chamber and said pressure sensing chamber and reciprocable along a path between said pressure sensing chamber and said pressure setting chamber between an open and a closed position on said trigger valve seat such that said trigger valve element is responsive to the differential in force between said pressure sensing chamber and said pressure setting chamber;

a relief valve element seat;

a low enertia relief valve element extending between said pressure setting chamber and said pressure sensing chamber and reciprocable along a path between said pressure sensing chamber and said pressure setting chamber between an open and a closed position on said relief valve seat such that said relief valve element is responsive to the differential in force between said pressure sensing chamber and said pressure setting chamber;

said trigger valve element seat and said relief valve element seat each being a positive stop for their respective valves;

a pressure relief passage;

said trigger valve element when seated on its seat being adapted to seal said pressure setting chamber and said pressure sensing chamber from said pressure relief passage and when open adapted to permit communication between said pressure setting chamber and said pressure relief passage, while still maintaining said seal between said sensing chamber and said relief passage;

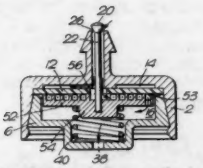
said relief valve element when closed being adapted to seal said pressure setting chamber and said pressure sensing chamber from said pressure relief passage and when open being adapted to permit communication between said pressure sensing chamber and said pressure relief passage, while still maintaining said seal between said setting chamber and said relief passage;

said trigger valve element and said relief valve element being reiprocable as aforesaid independently of each other.

4,796,660
DRIP EMITTER

Dan Bron, Haifa, Israel, assignor to Manisa Establishment, Zurich, Switzerland

Filed Mar. 4, 1987, Ser. No. 21,494
Claims priority, application Israel, Mar. 5, 1986, 78045
Int. Cl.[4] F16K *17/32*
U.S. Cl. 137—504 9 Claims



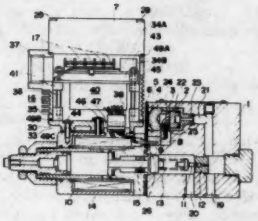
1. A flow-regulated drip emitter, comprising:
a housing provided with an inlet connector connectable to a relatively high-pressure liquid-line, and an outlet opening;
a flexible disphragm retained along a peripheral portion thereof in said housing and dividing the interior of said housing into an inlet chamber and an outlet chamber;
a flow-regulating valve comprised of a valve head accessible to said high presure and a valve stem one end of which is attached to said valve head;
at least one flow-attenuating element disposed in the path of said liquid flowing from said inlet chamber to said outlet chamber;
a valve seat associated with said valve head and located in a high-pressure region upstream of said inlet chamber, said valve seat and said valve head defining between them a gap through which the liquid passes on its way from said high-pressure line into said inlet chamber, said valve head being adapted to be acted upon by a first force tending to reduce said gap, and by a second force tending to increase said gap, a state of equilibrium between said forces defining the set point of said flow-regulated emitter.
wherein said gap is fully exposed to liquid flow in said high-pressure line, wherein said flow-attenuating element is in the form of a labyrinth-type passageway, at least one liquid-contacting, active wall of said flow-attenuating element being constituted by said flexible diaphragm, and
wherein the maximum opening size of said gap defined by said valve head and said valve seat is smaller than the maximum opening provided in aid labyrinth-type passageway.

4,796,661
PROPORTIONAL ELECTRO-HYDRAULIC PRESSURE CONTROL VALVE

Yasuo Hishinuma, Yokohama, and Hiroshi Ito, Kanagawa, both of Japan, assignors to Yuken Kogyo Kabushiki Kaisha, Fujisawa, Japan

Filed Aug. 19, 1986, Ser. No. 898,041
Claims priority, application Japan, Aug. 30, 1985, 60-131723[U]; Aug. 30, 1985, 60-131724[U]; Aug. 30, 1985, 60-131726[U]; Mar. 20, 1986, 61-39935[U]
Int. Cl.[4] F16K *31/02*
U.S. Cl. 137—487.5 15 Claims

1. In a proportional electro-hydraulic relief valve, said relief valve comprising:
a valve body,
a hydraulic fluid inlet port in said valve body,
a hydraulic fluid outlet port in said valve body,
a pressure detecting fluid path in said valve body filled with hydraulic fluid,
valve means arranged between said ports to control a pressure at said hydraulic fluid inlet port, and
proportional plunger means slidably mounted in said valve body for causing application of a force proportional to an input current for setting a controlled pressure to act on said valve means,
said valve means including a sensor holder having a pressure sensor mounted in a sensor receiving hole defined by said valve body for detecting a hydraulic fluid pressure in said pressure detecting fluid path and outputting the same as an electric signal, a pressure sensing portion of said pressure

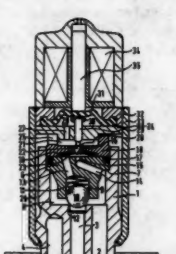


sensor being positioned so as to be exposed to said pressure detecting fluid path, said sensor holder being positioned and fixed in said valve body by a plug-and-snap assembly for preventing said pressure sensor from slipping out of position under the action for hydraulic pressure, and notches formed in said plug-and-snap assembly for accommodating signal lead wires from said pressure sensor.

4,796,662
VALVE ARRANGEMENT WITH MAIN SHIFTING VALVE AND PILOT CONTROL VALVE

Ruediger Hoffmann, Sindelfingen; Dieter Feichtiger, Aidlingen, and Paul Schwerdt, Freudenstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,268
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717341
Int. Cl.[4] F15B *13/043;* F16K *31/42*
U.S. Cl. 137—596.16 16 Claims



1. A valve arrangement comprising main shifting valve means, pilot control valve means including a valve member movable between two valve seats, said valve member being operable to be sealingly pressed against one valve seat by means of an externally actuatable plunger means and thereby closes off a connection between an inlet line with a control pressure space which is opened up when placed against the other valve seat and at the same time also opens a connection between the control pressure space and a return line which is closed off when the valve member of the pilot control valve

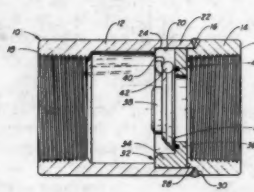
means is placed against the other valve seat, said main shifting valve means including a main valve member displaceable into a closing position by the pressure in the control pressure space when the connection between the inlet line and the control pressure space is open, said main valve member being displaceable into the control pressure space at least partly in the manner of a displacement member, the main valve member being operable to be sealingly pressed against its seat arranged between the inlet line and an outlet line when displaced into its closing position, valve housing means accommodating the control pressure space, the one valve seat of the pilot control valve means being provided at the other end face of the valve housing means opposite the control pressure space, a valve seat part arranged at said other end face of the valve housing means and providing the other valve seat of the pilot control valve means, a first intermediate space means operatively connected with the inlet line remaining between the seat of the main shifting valve means and the valve housing means, a second intermediate space means remaining between the valve seat part and the valve housing means, said second intermediate space means being operatively connected, respectively, operatively connectable by way of a line extending through the valve housing means with the first intermediate space means, by way of a further line extending through the valve housing means with the control pressure space and by way of an opening adjoining the other valve seat of the pilot control valve means respectively controlled by the valve member of the pilot control valve means with the return line, the inlet, outlet and return lines being arranged extending through a socket means of the valve arrangement and terminating at the same end face of the socket means, the socket means being provided at its end face opposite the orifices with a cup-like recess in which the inlet and outlet lines terminate on the side of the bottom, the seat of the main shifting valve means being arranged at the inlet orifice of the outlet line, the valve housing means being inserted into the cup-like recess in the manner of a plug while leaving free the first intermediate space means, the valve seat part resting on the end face of the valve housing means opposite the bottom of the cup-like recess in the manner of a cover and holding fast a sealing ring sealing the valve housing means in the cup-like recess at the facing circumferential edge of the valve housing means, sleeve means surrounding the socket means being arranged at the socket means under formation of an annular space which is operatively connected, on the one hand with the return line, and on the other, with a space present on the end face of the valve seat part opposite the valve housing means, said last-mentioned space being operatively connected with the second intermediate space means by way of an opening adjoining the other valve seat in the valve seat part.

4,796,663

FABRICATED CHECK VALVE CONSTRUCTION

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed May 20, 1988, Ser. No. 196,447
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—515.5 **15 Claims**



1. A valve for installation in adjacent sections of a pipe, a body, comprising:

a first, tubular body section having one end thereof adapted for connection with an adjacent pipe section, and having a counterbore in the opposite end thereof forming an annular shoulder facing in the same direction as said opposite end;

a second tubular body section having one end thereof adapted for connection with an adjacent pipe section, and having its opposite end welded to said opposite end of the first body section;

an annular seat secured in said counterbore;

a disc in the body having a hinge pin and supported for swinging movement to and from the seat for closing and opening the valve; and

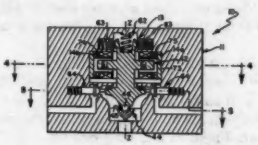
a cage member secured in said counterbore surrounding a portion of the disc when the disc is in engagement with the seat, a portion of the cage member forming a hanger for the disc hinge pin.

4,796,664

TWO-AXIS FORCE MOTOR

Hans G. Toews, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.

PCT No. PCT/US87/00730, § 371 Date Oct. 20, 1987, § 102(e) Date Oct. 20, 1987, PCT Pub. No. WO87/06051, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 25, 1987, Ser. No. 114,585
Int. Cl.[4] F16K *11/14*
U.S. Cl. 137—595 **13 Claims**



1. A two-axis force motor, comprising:

a body;

an armature mounted on said body for omni-directional pivotal movement relative thereto, said armature having an axis of elongation;

a centering device for urging said armature to move toward a null position relative to said body at which said armature axis will be coincident with a line defined by the intersection of two planes;

a first coil mounted on said body and selectively energizable to cause said armature to pivot off-null in one of said planes;

a second coil mounted on said body and selectively energizable to cause said armature to pivot off-null in the other of said planes; and

at least two actuators movably mounted on said body and engaging said armature, said actuators being arranged such that pivotal movement of said armature in any plane will cause at least one of said actuators to be displaced, each of said actuators being arranged to operated a valve.

4,796,665

MULTI-PURPOSE DRAINING VALVE

Charles Christiany, Fameck, France, assignor to Societe Lorraine de Laminage Continu - Sollac, Florange, France

Filed Feb. 2, 1987, Ser. No. 9,738
Claims priority, application France, Feb. 7, 1986, 86 01725
Int. Cl.[4] F16K *1/54, 49/00*
U.S. Cl. 137—614.13 **12 Claims**

1. A valve device for the sealing, draining or regulated discharging of a gaseous fluid circuit comprising:

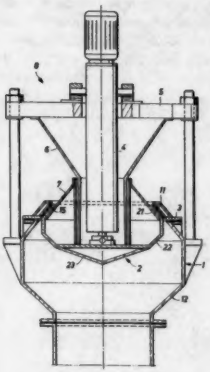
(a) a valve body provided with opposed first and second sealing seats;

(b) a valve element disposed inside the valve body for move-

ment along an axis of the device, the valve element being provided with opposed first and second bearing surfaces;

(c) the first and second sealing seats being, respectively, engagable by the first and second bearing surfaces for tightly separating a zone situated downstream of the device from a zone situated upstream of the device;

(d) control means, including a control unit and a support, for moving the valve element along the axis of the device to a predetermined position and maintaining the valve element in such position;



(e) the control unit including a first part joined to the valve body by the support, and a second part movable along the axis of the device, the second part being joined to the valve element; and

(f) the connection between the control unit and the support, and the connection between the control unit and the valve element being articulated and so disposed that their articulation axes are orthogonal one with respect to the other, and with respect to the axis of the device.

4,796,666

SANITARY SINGLE-HANDLE MIXING VALVE

Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

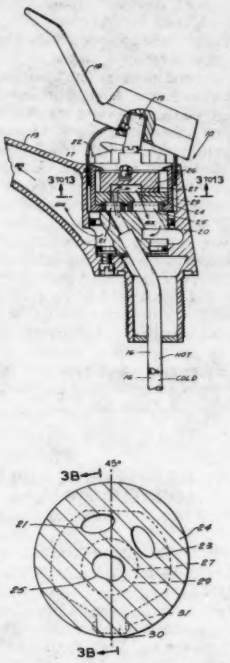
Filed Oct. 5, 1987, Ser. No. 104,629

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633995; Oct. 6, 1986, 8627223

Int. Cl.[4] F16K *11/06*

U.S. Cl. 137—625.17 **4 Claims**

1. A single-handle mixing valve in combination with an in-line flow heater, said mixing valve comprising: valving means having at least two disc, one of which is in the form of a fixed valve seat having an outlet opening and asymmetrically formed hot and cold water inlet openings, the other of said discs, arranged in face-to-face sealing contact with said valve seat disc, is shiftably mounted thereon, said movable disc having a chamber formed therein, so that when said movable disc is shifted a few degrees toward the cold water setting, the edge forming the perimeter of said chamber on said movable disc uncovers free flow areas of the asymmetrically formed hot and



cold water inlet openings whereby hydraulic symmetry is achieved.

4,796,667

BRAKE PRESSURE CONTROL VALVE

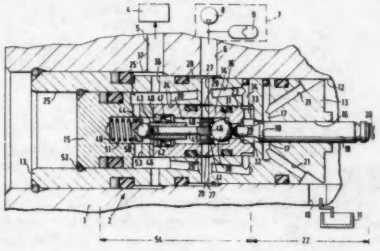
Georg Kehl, Stuttgart, and Ernst-Dieter Schäfer, Pliezhausen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,532

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619482

Int. Cl.[4] B60T *13/12*

U.S. Cl. 137—629 **5 Claims**



1. A brake pressure control valve comprising a brake pressure build-up valve having a valve chamber (30) with a first inner valve seat (31), a fluid pressure source connectable to

said valve chamber, a movable first valve member in said valve chamber for cooperation with said valve seat, a movable compensating piston (42, 42b) associated with said first valve member, a sealing ring (47) surrounding said compensating piston and arranged to enclose a portion of said compensating piston in a seal-tight manner, said compensating piston (42, 42b) further including an end means arranged to project from said valve chamber, said end means adapted to form a second valve seat, a second valve member arranged to cooperate with said second valve seat, said second valve member being connected to said first valve member via a rod which extends through said compensating piston with minimal radial play and a closing spring for closing said first and second valve members, a relatively movable control slide having opposite sides disposed between said compensating piston and said first valve member, said control slide being connected to said first valve member, said valve chamber further provided with a cylindrical bore in proximity to said control slide and adapted for enclosure thereof and to thereby form a fixed control valve sleeve; said control slide and said control valve sleeve comprises flow bores adapted to form a control valve which may be opened after the first valve member has been removed from said first valve seat, and further wherein at least one pressure compensating channel is provided which produces pressure compensating between said opposite sides of said control slide.

4,796,668

DEVICE FOR PROTECTING THREADINGS AND BUTT-TYPE JOINT BEARING SURFACES OF METALLIC TUBES

Jean-Paul Depret, Aulnoye Aymeries, France, assignor to Vallourec, France

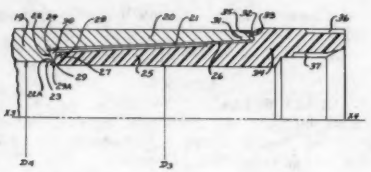
PCT No. PCT/FR85/00003, § 371 Date Jul. 18, 1985, § 102(e) Date Jul. 18, 1985, PCT Pub. No. WO85/03104, PCT Pub. Date Jul. 18, 1985

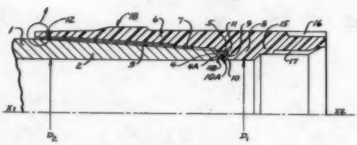
PCT Filed Jan. 7, 1984, Ser. No. 763,140

Claims priority, application France, Jan. 9, 1984, 84 00700

Int. Cl.[4] F16L *55/10*

U.S. Cl. 138—96 T **12 Claims**





1. A device for protecting male or female threadings and butt-type annular joint bearings of metallic tubes comprising:

a metallic tube provided with a joining region at one end thereof, said joining region including screw threadings which terminate in a butt-type joint having a butt-type bearing surface and inside and outside surfaces where said bearing surface and said inside surface meet to form an annular inner edge, a plastic ring provided with screwthreads for engaging said threadings of said metallic tube, said ring further having an annular abutment region provided with a front face which is dimensioned so as to face the butt-type bearing surface of the metallic tube when the ring is tightly screwed onto said tube, said front face having an inner surface which comprises a first annular tight sealing means which cooperates with the butt-type joint bearing surface near said annular inner edge to insure sealing, said front face being further dimensioned such that a closed annular volume is created between the entire butt-type joint bearing surface and said front face.

4,796,669

PRODUCT FOR RELINING SEWERS AND WATER PIPES

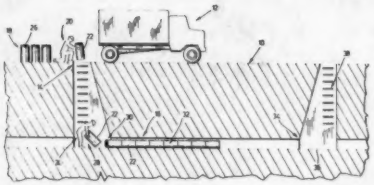
Henri S. St. Onge, Scarborough, Canada, assignor to Duratron Systems Limited, Scarborough, Canada

Continuation of Ser. No. 284,482, Jul. 17, 1981, abandoned. This application Jan. 13, 1986, Ser. No. 892,875

The portion of the term of this patent subsequent to Jun. 10, 2002, has been disclaimed.

Int. Cl.[4] F16L *55/18, 9/22*

U.S. Cl. 138—97 **14 Claims**



1. In combination, a plurality of plastic pipe lengths interconnected to reline an existing sewer, each pipe length having a male portion at one end of the pipe length and a female portion at the other end of the pipe length, said male and female portions forming an interconnection between adjacent pipe lengths, said male portion compressing against a sealing member about the interior of the female portion associated therewith, and including thread-like means for cooperating with an appropriately shaped interior of the associated female portion in a manner to maintain said interconnection when the combination is placed in axial tension or compression, each pipe length being of a length which allows insertion through a manhole and positioning of the entire pipe length in the manhole in a manner to align with the sewer.

4,796,670

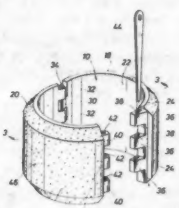
DRILL PIPE PROTECTOR

Larry R. Russell, Houston, and Kevin T. Corbett, Missouri City, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 15, 1987, Ser. No. 109,349

Int. Cl.[4] F16L *57/00*

U.S. Cl. 138—110 **14 Claims**



1. In a casing having a drill pipe element and a drill pipe protector disposed in said casing, protector comprising:

a support element adapted to be affixed to the outer surface of said drill pipe element; and

an elastomeric bearing element secured to said support element, said bearing element extending radially outward from said support element to define a radially outer contact surface of said drill pipe protector, said outer contact surface, at least a radially outermost portion of said bearing element and the remainder of said elastomeric bearing element being configured of an elastomeric material having a quantity of abrasive particles interspersed throughout said particles having a hardness of the MOH scale of hardness of at least 5, said particles having a size in the range of 0.05 to 3.0 millimeters, said particles making up between 8% to about 30% of the combined volume of said particles and said elastomeric material, some of said particles protruding from said outer contact surface, said particles being configured and arranged in such elastomeric material to provide a means to continually abrade and polish the interior surface of said casing and therby decrease torque and drag loads therebetween.

4,796,671

PROTECTIVE TUBE FOR THERMOCOUPLE AND METHOD OF PRODUCING SAME

Kiyoshi Furushima; Kazunori Haratoh, and Hideshige Matsuo, all of Kitakyushu, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Mar. 17, 1987, Ser. No. 26,751
Claims priority, application Japan, Mar. 18, 1986, 61-58325
Int. Cl.[4] H01L *35/02*
U.S. Cl. 138—140 **6 Claims**

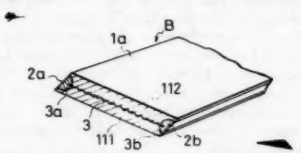
1. A protective tube for a thermocouple for measuring the temperature of molten metal, comprising two layers, an inner layer being made of a material selected from the group consisting of silicon nitride and sialon ceramic, said inner layer having a bending strength of 50 kg/mm^2 or more, a density of 90% or more based on a theoretical density and a thermal shock temperature ΔT of 400° C. or more, and protective means including an outer layer being formed on said inner layer and containing BN and SiO_2.

4,796,672

PRESSURE-WITHSTANDING PIPE

Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

Filed Aug. 13, 1986, Ser. No. 896,147
Claims priority, application Japan, Dec. 12, 1985, 60-280082
Int. Cl.[4] F16L *11/08*
U.S. Cl. 138—154 **16 Claims**



1. A pressure-withstanding pipe comprising: a single belt body helically wound to form a pipe, said body comprising a strip of a first soft synthetic resin material or a soft rubber material, said first material having an interior inner surface over the entire width of said body and an exterior outer surface and being helically wound to form an overall continuous interior wall of said pipe;

at least first and second reinforcing members of a second synthetic resinous material harder than said first material and embedded in said first material, said second material being enclosed in said first material so that said second material is not exposed at the interior surface of said pipe, but is enclosed by the interior surface of said first material; and

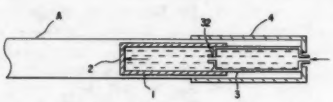
a reinforcing layer of a third material thinner than the second material and materially different therefrom, having first and second opposite side end portions embedded within said first material and secured to each of said first and second reinforcing members by embedding said first and second opposite side end portions of said thin reinforcing layer in said first and second reinforcing members, respectively.

4,796,673

REPRODUCTION PROCESS OF THE EXISTING PIPELINE

Kouhei Ueda, Kanagawa, Japan, assignor to Taisei Corporation, Tokyo, Japan

Continuation of Ser. No. 852,268, Apr. 15, 1986, abandoned.
This application Dec. 24, 1987, Ser. No. 139,097
Int. Cl.[4] F16L *1/00*
U.S. Cl. 138—97 **6 Claims**



1. A process for the reproduction of the pipe of an existing pipeline, said existing pipeline including an opened end, comprising the steps of:

(a) inserting into said pipeline from said opened end and axially of said pipeline, a first section of rigid pipe having an outer diameter slightly smaller than the inner diameter of said pipe of said existing pipeline, said first section having its interior front leading end temporarily blocked;

(b) advancing said front leading end of said first section of rigid pipe into said existing pipeline by applying fluid pressure into the interior of said inner pipe against said temporarily blocked front leading end until said first section of rigid pipe, except for its rear, trailing end and a portion of said first section immediately adjacent said trailing end and sufficient in length for connection to a section of rigid pipe remains exposed at said opened end;

(c) securing a second section of rigid pipe having an outer diameter and an inner diameter substantially equal to the outer and inner diameter of said first section to said rear, trailing end of said first section and advancing said first and second section of rigid pipe into said existing pipeline; and

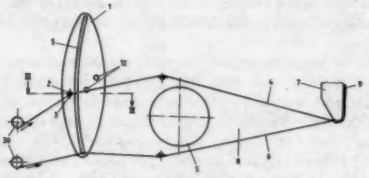
(d) repeating said steps of advancing sections of rigid pipe and securing an additional section of rigid pipe to the rear, trailing end of the previously inserted sections of rigid pipe, until said reproduction is completed.

4,796,674

SHED-FORMING APPARATUS FOR DOUP WEAVE

Rudolf Wolf, Lenzing, and Kurt Vilsecker, Gmunden, both of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Sep. 1, 1987, Ser. No. 91,933
Claims priority, application Austria, Sep. 1, 1986, 2354/86; Jul. 7, 1987, 1712/87; Aug. 13, 1987, 2048/87
Int. Cl.[4] D03D *37/00*
U.S. Cl. 139—13 R 11 Claims



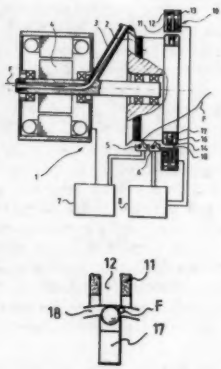
11. Circular loom comprising a shed-forming apparatus for producing a doup weave comprising shed-forming places, each provided with a slot for accommodatng a wip thread and a bore for accommodating a stationary thread and adapted to be pivoted back and forth, about a pivoting axis substantially normal to the wip thread and the stationary thread and essentially parallel to a warp plane wherein at least two of the shed-forming plates are rigidly interconnected by bolts positioned radially outwardly beyond the slot, at least one of said shed-forming plates being connected to at least one drive disc, the drive disc including a pivot for connection with a drive rod and carrying an axle pin for pivotal mounting.

4,796,675

YARN STORING, FEEDING AND MEASURING DEVICE

Lars H. G. Tholander, Huskvarna, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Continuation of Ser. No. 889,646, Jul. 24, 1986, abandoned, which is a division of Ser. No. 614,774, filed as PCT EP83/00254 on Sep. 30, 1983, published as WO84/01394 on Apr. 12, 1984, Pat. No. 4,627,474. This application Jan. 25, 1988, Ser. No. 147,649
Claims priority, application Sweden, Sep. 30, 1982, 8205598; Dec. 10, 1982, 8207096; Sep. 13, 1983, 8304891; Sep. 20, 1983, 8305040
Int. Cl.[4] D03D *47/36*; R65H *51/20*
U.S. Cl. 139—452 13 Claims



1. A yarn storing and feeding device comprising a stationary storage drum onto which an intermediate yarn store is wound by a winding-on device and from which the yarn is withdrawn spiralling through a gap around the withdrawal end of the storage drum, the stationary storage drum being surrounded by a stationary ring structure adjacent the withdrawal end so as to define said gap therebetween, and at least one yarn stopping means cooperating with the gap for stopping the withdrawal of yarn, said yarn stopping means including:

(a) a yarn stopping element arranged radially inwardly with respect to said gap and being supported on said drum for movement radially thereof between a retracted position wherein the stopping element is disposed radially inwardly of the gap and an extended position wherein an outer end part of the stopping element projects radially outwardly of the drum so as to radially span across said gap to contact said stationary ring structure and stop the withdrawal of yarn,

(b) electromagnetic actuator means for causing said stopping element to be moved radially outwardly into said extended position when said actuator means is energized, said electromagnetic actuator means being mounted on said ring structure radially outwardly with respect to said gap,

(c) means mounted on said stationary drum for at least partially urging said stopping element in its retracted position and for normally holding said stopping element in the retracted position; and

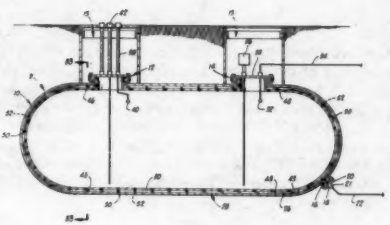
(d) said outer end part having a rounded yarn contact surface which is of a convex rounded configuration in the circumferential direction of the gap so that the tensioned yarn engages the contact surface when the stopping element is in said extended position and imposes thereon a force tending to move said stopping element back towards said retracted position.

4,796,676

FLUID STORAGE TANK SYSTEM

John A. Hendershot, P.O. Drawer 789, Shawnee, Okla. 74801, and Leale E. Streebin, 2301 Morgan Dr., Norman, Okla. 73069

Filed Jun. 5, 1987, Ser. No. 58,798
Int. Cl.[4] G08B *21/00*; G01M *3/26*
U.S. Cl. 141—83 21 Claims



1. A fluid storage tank system comprising:

an external tank having an inner side and an outer side;

a flexible inner tank positioned within and adjacent said external tank and defining with said external tank, a space therebetween;

said flexible inner tank having a geometric configuration complementary to that of said external tank, and said inner tank having an interior and an exterior;

registering access manholes in the inner and external tanks facilitating access to the interior of the inner tank so that said access manholes are registered;

means for sealing the inner and external tanks to each other at the registering access manholes with a seal adequate to impart fluid tight integrity to the space between the inner and external tanks;

means for removably closing said manholes and facilitating

the selective opening of the registered manholes without affecting the integrity of the seal of the tanks to each other at the registering access manholes;

means for reducing the pressure in said space between the tanks to a negative pressure below atmospheric pressure; and

means for periodically automatically evacuating such space to restore the negative pressure therein to a predetermined level.

4,796,677

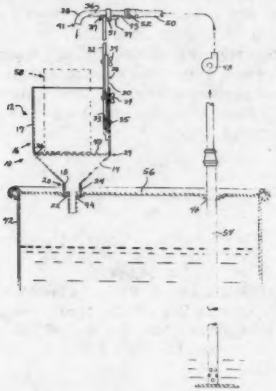
APPARATUS FOR FACILITATING LIQUID TRANSFER FROM A DRUM

Jeffrey D. Nice, 1515 Northridge, Columbus, Ohio 43224

Filed Jul. 1, 1987, Ser. No. 69,011

Int. Cl.[4] B67D *1/16*

U.S. Cl. 141—88 **4 Claims**



1. An apparatus for facilitating liquid transfer from a drum to a vessel with a return to the drum of unused liquid, comprising receptacle means for receiving and supporting the vessel to which liquid is to be transferred and having an inlet and egress end, the egress end having a first fluid coupling extending therefrom, the first fluid coupling having a threaded portion adapted to be threadably received in a threaded port of the drum, the threaded portion of the fluid coupling comprising first and second threaded portions, the first threaded portion being more distal from the egress end of the receptacle than the second threaded portion, the first threaded portion having an outside diameter less than an outside diameter of the second threaded portion, the first threaded portion adapted to be threadably received in a first threaded port of the drum for returning the unused liquid, the second threaded portion adapted to be threadably received in a second threaded port of the drum which is larger than the first port for returning the unused liquid, the receptacle including an upper skirt and a lower conical member, the apex of the conical member including the receptacle's egress end, the receptacle including an adjustable mounting bracket extending from the upper skirt and means for mounting a second fluid coupling to the adjustable mounting bracket, the second fluid coupling including means for flexibly coupling an inlet thereof to an outlet of a pump, an inlet of the pump being adapted to be independently connected via a further coupling into the drum to extend adjacent the bottom thereof, and the adjustable mounting bracket adjustable to fixedly locate the second fluid coupling in different positions with respect to the receptacle, to accommodate different sized receptacles.

4,796,678

LIQUID DELIVERY APPARATUS

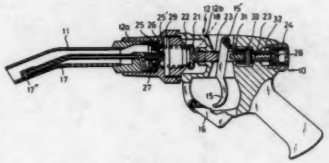
Toshiaki Motohashi, and Yasushi Saisu, both of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 120,436

Claims priority, application Japan, Nov. 13, 1986, 61-270338

Int. Cl.[4] B65B *3/26*

U.S. Cl. 141—206 **8 Claims**



1. Apparatus for liquid delivery comprising a barrel portion having an open free end;

a hollow body portion integrally fixed thereto and having an inlet to form a liquid passage extending therefrom through the barrel portion to said open free end;

a trigger mounted at said body portion so as to be manually actuated;

a main valve arranged downstream from said inlet in the liquid passage in the body portion and having a valve rod to be longitudinally movable together;

a valve set arranged so as to face said main valve and having a wall exposed in the liquid passage around said main valve;

first spring means for urging said main valve toward said valve seat for normally closing the liquid passage;

an extended bar arranged so as to be longitudinally moved by the actuated trigger;

second spring means for urging said bar toward said trigger;

means for disengageably engaging said bar with said valve rod so as to be longitudinally movable together;

and means for detecting liquid level rising up close to the open free end of said barrel portion and adapted to actuate said engaging means so as to disengage said bar from said valve rod when detecting liquid inclusive of bubbles and splashes thereof; in which

said valve seat is made slidingly movable toward said main valve by third spring means and apart therefrom by pressure force of liquid pumped up through said inlet in the liquid passage to be just in front of said main valve and the exposed wall of said valve seat against the force of said third spring, to which said main valve follows by the force of said first spring means;

whereby when actuating the trigger, the bar and consequently the valve rod engaged therewith is longitudinally moved against the force of said first spring means so as to open the liquid passage;

when said detecting means detects liquid splashes and bubbles, said valve rod is disengaged from said bar so that said valve rod is longitudinally moved by said first spring means despite of that the trigger is still actuated and the main valve closes the liquid passage; and,

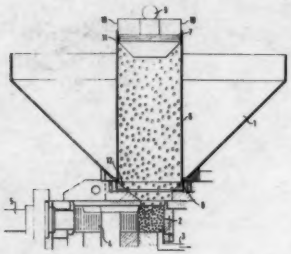
when liquid is freed from pressure, the main valve seat is slidingly moved toward the main valve by the force of said third spring means so that said detecting means now detecting no splashes and bubbles actuates said engaging means so as to engage said bar with said valve rod again.

4,796,679

APPARATUS FOR DISPENSING A DEFORMABLE AND FLOWABLE FILLING MATERIAL

Albert Frey, Fischerstr. 21, 7922 Herbrechtingen, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,636
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605896
Int. Cl.[4] A22C *11/06*; B65B *3/12*
U.S. Cl. 141—258 7 Claims



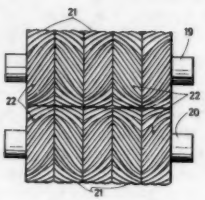
1. Apparatus for dispensing a deformable and flowable comprising: a filling funnel having a top end and a base end; a filling chamber disposed beneath said filling funnel; an outlet at said base end of said filling funnel; means for subjecting said filling chamber to a vacuum to draw said filling material downwardly from said filling funnel into said filling chamber; a dispensing tube communicating with said filling chamber for the dispensing of said filling material from said filling chamber; and a cylindrical filling tube having top and bottom ends, wherein said bottom end is coaxially insertable into said filling funnel above and in communication with said outlet, and wherein a lid is provided within said cylindrical filling tube, there being means for guiding said lid for axial movement within said cylindrical filling tube from said top end thereof to said bottom end, said lid thereby forming a wandering terminal wall of said filling tube, whereby said cylindrical filling tube is adapted for the transfer of residual quantities of said filling material through said outlet into said filling chamber under the influence of said means for subjecting the filling chamber to a vacuum.

4,796,680

APPARATUS FOR TENDERIZING VENEER SHEETS

Yoshinori Koba, Tokaishi, Japan, assignor to Meinan Machinery Works, Inc., Japan

Filed Apr. 8, 1987, Ser. No. 36,004
Claims priority, application Japan, Apr. 10, 1986, 61-82492
Int. Cl.[4] B27M *1/02, 3/00*
U.S. Cl. 144—2 R 12 Claims



1. An apparatus for tenderizing veneer sheets, comprising

(a) a pair of first and second rotatable press means each having a circumference with a plurality of radial projections extending in predetermined directions,

(b) said projections of each said press means being formed of substantially rigid material,

(c) each said projection of each said press means having a top for pressing against a veneer sheet to be tenderized,

(d) said first and second press means being so located relative to each other that the tops of the projections of the first press means and the tops of the projections of the second press means are separated by less than the thickness of the veneer sheet when the projections of the two press means are opposed to each other during rotation thereof,

(e) means mounting the two press means for passing the veneer sheet between the press means, for tenderization, with such an orientation that the fibers thereof extend along directions predetermined relative to the directions of axes of rotation of the two press means, and

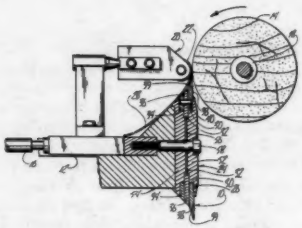
(f) the tops of the projections of the first press means and the tops of the projections of the second press means defining respective first and second elongate regions, said regions intersecting each other transversely to form localized intersection regions of sufficiently high compression between opposed projections pressing against the veneer sheet from opposite sides as the sheet is passed therebetween, to produce small cracks in the sheet localized at said intersection regions.

4,796,681

CONTINUOUSLY MOVING LATHE KNIFE

Leonard L. Hayes, P.O. Box 230215, Tigard, Oreg. 97223

Filed Jan. 4, 1988, Ser. No. 140,732
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—212 11 Claims



1. A knife assembly for cutting layers of veneer from the surface of a log, comprising:

a frame;

a knife carriage on such frame;

a chain bar on such knife carriage;

a chain channel with an angular groove extending substantially around said chain bar;

a continuous chain comprising a plurality of pivotally connected chain links movably extending through said channel and a stabilizing link secured to each of said pivotally connected links, said stabilizer links being slidably mounted in said annular groove, each chain link including a knife tip;

means for moving the surface of the log and the carriage relative to one another; and

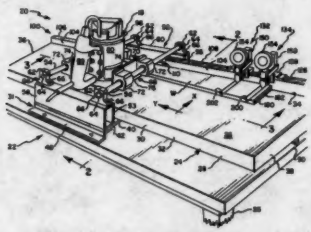
means on said frame for rotating said chain around said chain bar and within said channel such that said knife tips cut a layer of veneer from said log.

4,796,682

GROOVING APPARATUS

John Michaels, 7454 Shawnee Rd., N. Tonawanda, N.Y. 14120-1368

Filed Nov. 2, 1987, Ser. No. 116,369
Int. Cl.[4] B27M *1/00*
U.S. Cl. 144—371 5 Claims



4. A method for forming a blank for a mitre corner square box drawer formed of a workpiece having an outer surface defined by a flexible material, said method comprising the following steps:

(a) providing a planar support having an upper horizontally disposed planar surface, a fence along one side of said surface, means to clamp a workpiece upon said surface, means to cut a V-shaped groove across a workpiece in a direction perpendicular to the fence and parallel to the planar surface, and first stop means provided with a V-shaped stop capable of engaging a previously cut V-shaped groove;

(b) positioning a workpiece on the planar surface with the flexible material adjacent said surface and with one side of the workpiece in engagement with said fence;

(c) clamping said workpiece in said position;

(d) cutting a single V-shaped groove across said workpiece and to a depth wherein the only remaining material is the flexible material adjacent said planar support;

(e) unclamping the workpiece;

(f) repositioning the workpiece with the first V-shaped groove being engaged by the V-shaped stop said first stop means;

(g) repeating steps c, d and e to form a second V-shaped groove;

(h) repositioning the workpiece with the second V-shaped groove being engaged by the V-shaped stop of the first stop means;

(i) repeating steps c, d an e to form a third V-shaped groove in the workpiece;

(j) repositioning the workpiece with the third V-shaped groove being engaged by the V-shaped stop of said first stop means;

(k) repeating steps c, d and e to form a fourth V-shaped groove in the workpiece;

(l) repositioning the workpiece with the fourth V-shaped groove being engaged by the V-shaped stop of the first stop means; and

(m) repeating steps c, d and e to form a fifth V-shaped groove.

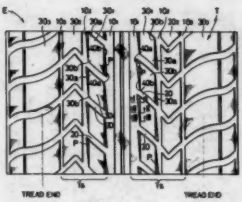
4,796,683

PNEUMATIC RADIAL TIRE

Misao Kawabata, Saitama, and Tetsuro Kobayashi, Fussa, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,944
Claims priority, application Japan, Apr. 30, 1986, 61-99553
Int. Cl.[4] B60C *11/04, 11/11*
U.S. Cl. 152—209 R 9 Claims

1. A pneumatic radial tire having a tread portion comprising; blocks having sidewalls with a slope and arranged on a tread surface thereof and partitioned by a pair of first relatively wide main circumferential grooves (10_1) formed at a tread crown portion thereof, at least a pair of second relatively narrow main circumferential grooves (10_2) extending in parallel to and axially outside the first main circumferential grooves, and transverse grooves intersecting the first and second main circumferential grooves being inclined at an angle thereto, wherein difference in inclination angle between the block



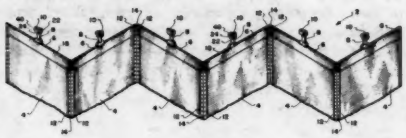
sidewall slope and a line perpendicular to the tread surface, of block sidewalls (40) between acute angle corners (30*a*) and obtuse angle corners (30*b*) on the first main circumferential groove (10_1) side is greater than that of block sidewalls on the second main circumferential groove (10_2) side, and wherein said inclination angle increases gradually from the obtuse angle corner to an acute angle corner.

4,796,684

COMPACT DRAPERY SYSTEM

Leonard J. Halmovitz, 1059 Summit Rd., Santa Barbara, Calif. 93108

Filed May 26, 1987, Ser. No. 53,711
Int. Cl.[4] A47H *1/00*
U.S. Cl. 160—330 13 Claims



1. A drapery system comprising:

a drapery composed of a sheet of fabric folded to define a plurality of contiguous panels;

a track means for supporting said drapery from an adjacent structure, said track means having a lower track portion; and

a plurality of hanger glides secured to said panels to support said drapery from said track means, each of said hanger glides comprising

a flat, elongated base portion secured to an upper edge of a respective one of said panels,

a neck portion connected to and projecting upwardly from said base portion, and

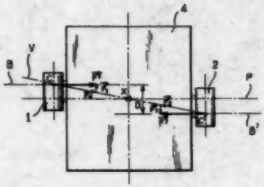
a head portion mounted at an upper end of said neck portion, said head portion having a forwardly projecting lip disposed in overlying, engaged relation upon said lower track portion and a rearwardly projecting flange vertically offset upwardly from said lip and spaced above said lower track portion through a distance at least slightly greater than the vertical thickness of said lip so as to permit said flange to overlie and overlap in a vertical plane the lip of an adjacent hanger glide and thereby enable said head portions of adjacent hanger glides to nest together in a partial overlapping arrangement in a vertical plane when said drapery is in its retracted position.

4,796,685

VIBRATING TABLE FOR FORMING SAND MOLDS

Jean-Jacques Hanneton, Nogent le Roi, and Michel Sivori, Les-Clayes-Sous-Bois, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Oct. 22, 1986, Ser. No. 921,408
Claims priority, application France, Oct. 29, 1985, 85 16028
Int. Cl.[4] B28B *1/08*; B22C *15/10*
U.S. Cl. 164—203 2 Claims



1. A vibrating table for compacting sand in a rigid foundary mold, comprising:

a stationary frame;

a horizontal plane having a central vertical axis, said horizontal plate comprising means for fixedly supporting a foundary mold directly on said plate;

elastic damping means for supporting said horizontal plate on said frame; and

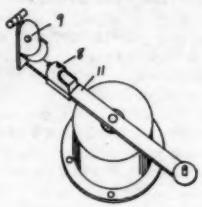
two rotary vibrators fixed directly to said horizontal plate, said vibrators having unbalance rotors defining unbalance axes of rotation extending perpendicular to a vertical reference plane passing through said central vertical axis, said rotors each defining an unbalance center on a respective one of said unbalance axes, said centers each lying in a plane perpendicular to said vertical reference plane and in which centrifugal forces derived form the rotation of said unbalance rotors extend, said unbalance centers being offset and mutually symmetrical with respect to said central vertical axis, said vibrators also having means for operating said vibrational means in synchronism and in opposite directions.

4,796,686

CENTRIFUGAL CASTING MACHINE WITH VENTURI ACTUATED VACUUM VENTING

Donald W. Gayso, 1092 Perkins Ter., Memphis, Tenn. 38117

Filed Aug. 20, 1986, Ser. No. 898,381
Int. Cl.[4] B22D *13/10*; B29C *7/84*
U.S. Cl. 164—287 2 Claims



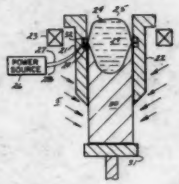
1. In a centrifugal molding apparatus having at least one mold defining a mold cavity, attached to an arm mounted for rotation, the improvement comprising: at least one venturi connected with said mold and mounted such that rotation of said arm will induce a negative pressure in said cavity to vent gases from said cavity.

4,796,687

LIQUID/SOLID INTERFACE MONITORING DURING DIRECT CHILL CASTING

Brian G. Lewis, Branford, and John C. Yarwood, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 10, 1987, Ser. No. 71,836
Int. Cl.[4] B22D *11/16, 27/02*
U.S. Cl. 164—455 44 Claims



1. An apparatus for monitoring the liquid/solid interface position of an ingot being formed by a direct chill casting system having mold walls, starter block and coolant, said apparatus comprising:

an inductive sensor wire disposed within about 3 mm of the inner surface of said mold wall of the direct chill casting system;

a direct power source means for driving said inductive sensor wire causing a magnetic flux to penetrate into said ingot; and

means for sensing a change in the impedance of said system.

24. A process for monitoring the liquid/solid interface position of an ingot being formed by a direct chill casting system having mold walls, starter block and coolant, said process comprising:

positioning an inductive sensor wire within about 3 mm of the inner surface of said mold walls of said direct chill casting system;

driving said inductive sensor wire at a predetermined frequency to generate a magnetic flux which penetrates into said ingot; and

sensing a change in the impedance of said system.

4,796,688

METHOD FOR CONTROLLING THE MELTING AND CASTING PROCESS IN PRECISION CASTING, PARTICULARLY FOR DENTAL ENGINEERING, AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Hans-Werner Gundlach, Bremen, and Friedrich Jacob, Lilienthal, both of Fed. Rep. of Germany, assignors to Bego Bremer Goldschagerei Wilh. Herbst GmbH & Co., Bremen, Fed. Rep. of Germany

Continuation of Ser. No. 826,399, Feb. 5, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,056
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505346
Int. Cl.[4] B22D *37/00*
U.S. Cl. 164—457 14 Claims

1. Method for controlling the melting and casting process in precision casting under the control a heating system, particularly for dental engineering, comprising the following steps:

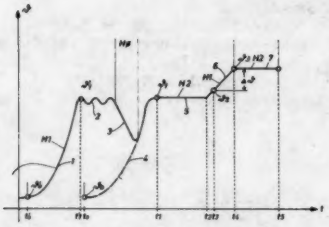
heating a melting charge by supplying thermal energy to the melting charge;

continuously measuring the temperature of the melting charge with respect to time; calculating the slope of temperature, i.e. the change with time ($d\theta/dt$) of the temperature θ of the melting charge;

generating, during supply of energy to the melting charge, a first signal at a time t1 when the slope deviates from an initially high value of slope greater than zero to a slope of substantially zero;

generating a second signal at a time t3 when the slope increases from the slope of substantially zero to a constant

slope of substantially greater than zero wherein at time t1 the melting charge reaches the solidus temperature and at time t3 when all the melting charge changed from solid to liquid phase, and said higher value corresponding to a



moment the temperature of the melting charge reaches the liquidus temperature; and

generating a third signal at a time t3' for triggering the casting process, said third signal being delayed by a predetermined period of time with respect to said second signal.

4,796,689

MOLD FOR ELECTROMAGNETIC CONTINUOUS CASTING

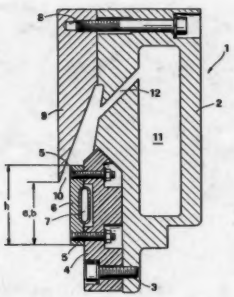
Jean-Claude Weber, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 14, 1988, Ser. No. 167,536

Claims priority, application Switzerland, Mar. 23, 1987, 1095/87

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—503 **8 Claims**



1. A mold for the electromagnetic continuous casting of rolling slabs comprising a substantially rectangular support frame having a pair of broad sides and a pair of narrow sides, an inductor associated with said substantially rectangular support frame for applying a magnetic field to define a mold cavity, and a screen associated with said substantially rectangular support frame and said inductor for controlling the electromagnetic force applied by said inductor wherein the screen at the narrow sides of the substantially rectangular support frame is arranged with respect to the inductor such that the electromagnetic force acting on the mold cavity is greater at the narrow sides of the mold than at the broad sides of the mold.

4,796,690

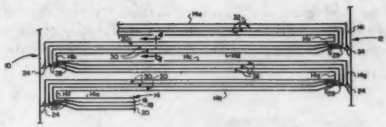
SUPPORT SYSTEM FOR HEAT EXCHANGE TUBE

Frantisek L. Eisinger, Demarest, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Continuation-in-part of Ser. No. 799,389, Nov. 18, 1985, abandoned. This application Apr. 8, 1987, Ser. No. 36,821

Int. Cl.[4] F22B *37/24*

U.S. Cl. 165—67 **3 Claims**



1. A heat exchange apparatus comprising an enclosure, a plurality of heat exchange tubes disposed in said enclosure, means for supporting each tube relative to two opposed upright walls of said enclosure, each tube being formed in a serpentine manner with adjacent tube sections of each tube extending horizontally in a vertically spaced, parallel relationship between said upright walls, a first and second series of connector means connecting adjacent tube sections adjacent said two opposed walls, respectively, a third series of connecting means connecting adjacent tube sections at a distance from one of said walls between one-fourth and one-third the distance between said walls, and a fourth series of connecting means connecting said adjacent tube sections at a distance form the other of said walls between one-fourth and one-third said distance between said walls, each connecting means being offset from its adjacent connecting means in a horizontal direction said connecting means constituting the only support between said adjacent sections.

4,796,691

FLUIDIZED BED HEAT EXCHANGE APPARATUS

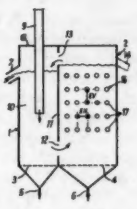
Jean-Francois Large, Compiegne, and Pierre F. Guigon, Le Meux, both of France, assignors to Charbonnages de France, Paris, France

Continuation-in-part of Ser. No. 855,475, Apr. 24, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 73,349

Claims priority, application France, Apr. 24, 1985, 85 06248

Int. Cl.[4] F28D *19/02, 13/00*

U.S. Cl. 165—104.16 **4 Claims**



1. Heat exchange apparatus comprising a first fluidization chamber, first gas supply means for supplying fluidizing gas to said first fluidization chamber, and means for feeding particulate material to said first fluidization chamber, said particulate material having average dimensions of between 50 and 3000 micrometers, and a second fluidization chamber, second gas supply means for supplying fluidizing gas to said second fluidization chamber, and discharge means through which the particulate material can be discharged from said second fluidization chamber, and means providing communication between said first and second fluidization chambers, the maximum speed of the fluidizing gas in said second chamber being

arranged to be between 1.5 times and 10 times the minimum fluidization speed of the particulate material, the apparatus further comprising a plurality of spaced apart heat exchange tubes received within the second fluidization chamber, adjacent heat exchange tubes being horizontally spaced by a distance of between substantially 1.4 to 2.1 times the external diameter of said tubes and spaced by a vertical distance of between substantially 1.4 to 2.1 times the external diameter of said tubes, said distances between said tubes and said second chamber permitting a differential density to be achieved between said first and second chambers to thereby result in an improved heat transfer coefficient while permitting operational flexibility.

4,796,692

CONVECTOR WITH FINNED TUBES

László Szücs, and József Szabó , both of Budapest, Hungary, assignors to Energiagasdalkodasi Intezet, Budapest, Hungary

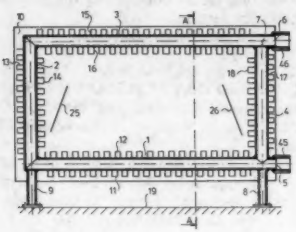
PCT No. PCT/HU86/00011, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/04981, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 21, 1986, Ser. No. 932,510

Claims priority, application Hungary, Feb. 22, 1985, 675/85

Int. Cl.[4] F24H *9/02*

U.S. Cl. 165—129 **7 Claims**



1. A convector for heat exchange between a hot first medium and second medium to be heated, comprising a substantially horizontal lower finned tube, one end of which is provided with a first opening for the first medium; a substantially vertical lateral finned tube connected to the other end of said lower finned tube, said lateral finned tube constituting a first lateral ording element for an upright channel for the second medium; a substantially horizontal upper finned tube constituting an upper closure for an upright channel, one end of said upper finned tube being connected to the upper end of said lateral finned tube, the other end of said upper finned tube being provided with a second opening for the first medium; said lower lateral and upper finned tubes having accordion-like fins comprising fin sections substantially perpendicular to the axis of the like respective tubes; and said lower, lateral, and upper finned tubes constituting a path for the first medium between said first and second opening; a second lateral bording element for the upright channel, said second lateral bording element being disposed between said one end of the lower finned tube and said other end of said upper finned tube so that said lower, lateral, and upper finned tubes and said second lateral bording element constitute a self-supporting structure; and a bording front plate for the upright channel, fastened to that self-supporting structure.

4,796,693

FINNED TUBE WITH INDENTED GROOVE BASE AND METHOD OF FORMING SAME

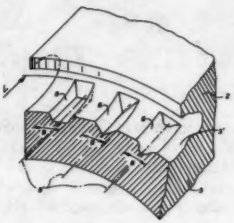
Hans-Werner Kastner, Vöhringen; Robert Klöckler, Tiefenbach, and Manfred Hage, Senden-Ay, all of Fed. Rep. of Germany, assignors to Weiland-Werke AG, Graf-Arco-Strasse, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,194

Claims priority, application European Pat. Off., Oct. 31, 1985, 85113859

Int. Cl.[4] F28F *1/42*

U.S. Cl. 165—133 **30 Claims**



1. A tube for heat transfer systems having radially extending fins disposed on the outer surface thereof, grooves disposed between adjacent fins, said grooves having a base, a plurality of spaced indents formed in the base of said grooves, said tube having a smooth interior surface; said indents having a first dimension extending substantially in the direction of the length of said grooves and a second dimension substantially transverse to said first dimension, said first dimension being less than or equal to said second dimension.

4,796,694

COOLING FIN FOR HEAT EXCHANGER

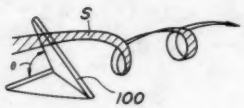
Shiro Ikuta; Eizo Suyama; Masaru Yokoyama, and Takeshi Yoshimura, all of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,694

Claims priority, application Japan, Aug. 26, 1985, 60-129877[U]

Int. Cl.[4] F28D *1/02*

U.S. Cl. 165—152 **16 Claims**



1. In a heat exchanger

a plurality of tubes through which a working fluid flows, said plurality of tubes being spaced apart from one another by a predetermined distance;

a fin connected with and extending between said plurality of tubes, said plurality of tubes and said fin being arranged so that heat is exchanged therebetween via conduction, said fin being exposed to a flow of fluid medium with which heat exchange is to be effected;

means formed on said fin for causing a plurality of spiral flow patterns in a flow of medium which flows over first and second major surfaces of said fin, said spiral flow causing means comprising:

a plurality of shaped projections each which extend from one of said first and second major surfaces of said fin at a predetermined angle, each of said shaped projections being oriented to split the flow of the fluid medium which

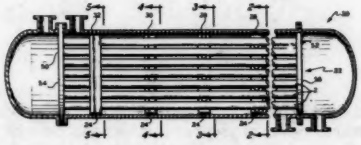
contacts the same, into at least two spiralling flows which curl in toward each other downstream of the projection and subsequently contact the major surface of said fin form which each of said shaped projections extend at locations separate from and downstream of said projections, said projections being formed in a manner that a plurality thereof are provided per said predetermined distance by which said plurality of tubes are spaced apart from one another.

4,796,695

TUBE SUPPORTS

Kenneth A. Cannon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 30, 1983, Ser. No. 509,542
Int. Cl.[4] F28F *9/23, 9/00*
U.S. Cl. 165—159 **11 Claims**



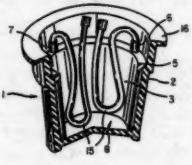
3. Apparatus comprising a plurality of parallel tubes arranged in the form of a tube bundle having a first plurality of parallel tube rows with lanes between adjacent rows and a second plurality of parallel tube rows with lanes between adjacent rows and support structure for supporting the tubes, said support structure comprising at least a first baffle and a second baffle wherein each baffle comprises an outer ring surrounding the tube bundle and at least one slat attached to the outer ring as a chord and extending through the tube bundle between adjacent row sin one of said pluralities of parallel tube rows, said at least one slat being characterized by corrugations or folds extending along its length for point contact with the tubes of the bundle, the at least one slat in the first baffle extending in lanes between the first plurality of parallel tube rows, the at least one slat in the second baffle extending in lanes between the second plurality of parallel tube rows.

4,796,696

DEVICE FOR HEATING OR COOLING INFUSION FLUIDS OR INJECTABLE FLUIDS

Paul M. Stocton, Dallas, Tex.; Michael Greive, Senden-Ottmarsbocholt, and Raymond Glocker, Munster-Hiltrup, both of Fed. Rep. of Germany, assignors to Glocker und Greive GmbH, Fed. Rep. of Germany

Filed Jul. 2, 1986, Ser. No. 881,103
Int. Cl.[4] F28F *3/12;* A61F *7/12*
U.S. Cl. 165—169 **9 Claims**



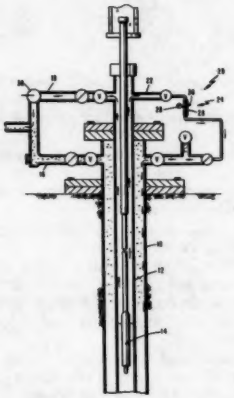
1. A device for heating or cooling infusion fluids or injectable fluids comprising a heat exchanger in the form of a hollow cylindrical or truncated conical pot, open at the top, characterized in that the pot has a double casing and the outer wall of the pot is higher than the inner wall of the double casing whereby the hollow space of the casing is sealed by a ledge surrounding the brim of the inner wall and extending outwardly to the outer wall and the ledge is provided with two connection branches, one branch for the inlet of said infusion fluids or injectable fluids to be cooled or heated and the other branch for the outlet of said infusion fluids or injectable fluids after being cooled or heated, spaced apart from each other and extending within the inner space of the pot and below the brim of the outer wall of said pot, said outer wall is further provided with a circumferentially outwardly extending ledge at the brim to accommodate a sealing sheet.

4,796,697

SLIP STREAM DEVICE

Robert N. Ayres, 7009 Meadowview Loop W., Lake Charles, La. 70605

Filed Jul. 8, 1987, Ser. No. 71,020
Int. Cl.[4] E21B *37/08*
U.S. Cl. 166—90 **7 Claims**



1. A device for continuously adding chemicals to a production oil and gas well including a casing extending into the ground with a substantially coaxially disposed tubing therein wherein a down hole pump pumps crude oil upwardly through the tubing and gas flows upwardly through the casing, said device comprising:

an above ground mixing chamber having an inlet and an outlet;

first means communicating between said tubing and inlet for diverting a flow of production oil into the inlet;

pressure responsive valve means at the inlet for closing the inlet when the pressure within the chamber exceed a predetermined value;

second means downstream of the inlet for admitting a predetermined flow of liquid chemical into said chamber; and

choke means disposed within said chamber downstream of said second means for permitting only a predetermined flow rate of the liquid contents thereof through the outlet

conduit means communicating between the outlet and said casing for conveying the flow through the outlet in the casing;

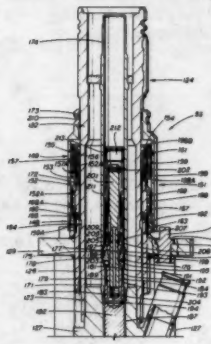
whereby said liquid contents flush downwardly through said casing through the well to be pumped upwardly through the tubing.

4,796,698

LANDING NIPPLE AND PLUG

John C. Gano, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 867,499, May 28, 1986, Pat. No. 4,691,781. This application May 7, 1987, Ser. No. 46,634
Int. Cl.[4] E21B 33/128
U.S. Cl. 166—135 5 Claims



1. An apparatus comprising:
landng nipple means providing passageway means therethrough;
upwardly facing no-go shoulder means in said passageway means;
locking groove means in said passageway means above said no-go shoulder means;
said locking groove means including downwardly facing cam shoulder means; and
plug means in said passageway means comprising:
plug housing means;
downwardly facing shoulder means on said housing means confronting said no-go shoulder means;
metal seal means on sad plug housing means between said no-go shoulder means and said downwardly facing shoulder means;
bore means in said plug housing means having threads adjacent the lower end of said bore means;
lug means carried by said plug housing means;
said lug means having upwardly facing surfaces complementary to and engaging said cam shoulder means;
stem means having a threaded nose in threaded engagement with said bore means threads;
downwardly facing expander cone means on said stem means for expanding said lug means;
said cone means in engagement with said lug means and holding said lug means upwardly facing surfaces in engagement with said downwardly facing cam shoulder means to compress said seal means; and
wrench means on the upper end of said stem means for threading said stem means into said bore means to expand said lug means and compress said seal means between said no-go shoulder means and said housing shoulder means to seal therebetween.

4,796,699

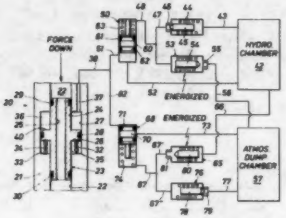
WELL TOOL CONTROL SYSTEM AND METHOD

James M. Upchurch, Sugarland, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed May 26, 1988, Ser. No. 198,968
Int. Cl.[4] E21B 34/10, 47/06, 49/08
U.S. Cl. 166—250 44 Claims

1. Apparatus for use in operating a downhole well tool that includes a pressure responsive member which is adapted to be shifted from one position to another position comprising: a pressure responsive surface on said member; and means for supplying a working medium to said surface at a pressure substantially equal to the hydrostatic pressure of well fluid to shift said member from said one position to said other position in response to a comand signal applied to said well fluid, said command signal including at least one low level pressure pulse having a predetermined signature.

23. A method of controlling the operation of a downhole well tool having a pressure responsive member which is



adapted to be shifted from one position to another position, said member having pressure responsive surface means, comprising the steps of: applying a command signal to fluids in the well, said command signal including at least one low level pressure pulse having a predetermined signature; detecting said command signal at said well tool; and supplying a working medium at a pressure substantially equal to hydrostatic pressure to said pressure responsive surface means in response to detection of said command signal to shift said pressure responsive member from said one position to said other position.

4,796,700

PROCESS FOR RETARDING FLUID FLOW

Burton B. Sandiford, Balboa Island, Calif., and Roger C. Zillmer, Bloomington, Minn., assignors to Cities Service Oil and Gas Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 624,111, Jun. 25, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,156
Int. Cl.[4] E21B 43/12; C08J 3/24
U.S. Cl. 166—270 37 Claims

1. A process for retarding the flow of fluid in a subterranean formation, comprising:
(a) introducing an effective amount of a gel-forming composition into a subterranean formation, said gel-forming composition being operable when gelled in said formation for retarding the flow of fluid therein, said gel-forming composition comprising
i. a first substance dissolved in water to form an aqueous solution, said first substance being selected from the group consisting of polyvinyl alcohols, and mixtures thereof, wherein said gel-forming composition contains an amount of said first substance of from about 0.5 to about 5 weight percent of said gel-forming composition, and
ii. an effective amount of glutaraldehyde which is operable for forming a weakly acidic condition having a pH from about 5.5 to less than 7 in said gel-forming composition and also operable for promoting crosslinking of said first substance and glutaraldehyde and for forming a gel from said gel-forming composition under said weakly acidic condition within a period of time no greater than about 5 days without adding an acidic catalyst to said gel-forming composition to lower the pH of said gel-forming composition below about 5.5,
wherein, other than glutaraldehyde and acidic products produced in said gel-forming composition from said glutaraldehyde, said gel-forming composition is substantially free of effective amounts of crosslinking cata-

lyzing substances which are operable for promoting substantial acidic catalysis of a crosslinking reaction which is sufficient to form a gel within a period of time no greater than about 5 days,

wherein said effective amount of glutaraldehyde is also from about 0.15 to about 4 weight percent of said gel-forming composition; and

(b) allowing said gel-forming composition to form a gel in said subterranean formation within a period of time no greater than about 5 days without adding an acidic catalyst to said gel-forming composition to lower the pH of said gel-forming composition below about 5.5, said thusly formed gel being effective for retarding the flow of fluid therein.

4,796,701

PYROLYTIC CARBON COATING OF MEDIA IMPROVES GRAVEL PACKING AND FRACTURING CAPABILITIES

Tommy E. Hudson, Skiatook, and James W. Martin, Broken Arrow, both of Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jul. 30, 1987, Ser. No. 79,728
Int. Cl.[4] E21B *43/04, 43/267*
U.S. Cl. 166—278 12 Claims

1. A method for placement of particles in a well comprising the steps of:

(a) providing pyrolytic carbon coated particles comprised of a thermally stable substantially spherical substrate particles and a substantially uniform layer of pyrolytically deposited carbon encapsulating each of said thermally stable substantially spherical substrate particles;

(b) suspending said prolytic carbon coated particles in a fluid; and

(c) pumping said fluid with suspended pyrolytic carbon coated particles into a well.

4,796,702

MULTIPURPOSE AQUEOUS FOAMER

Gary A. Scherubel, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 624,065, Jun. 25, 1984, abandoned. This application Sep. 4, 1987, Ser. No. 96,261
Int. Cl.[4] E21B *37/00, 43/26*
U.S. Cl. 166—308 14 Claims

1. An aqueous composition containing from about 0.025 to about 1.0 percent by weight of a composition comprising from about 5 to about 20 percent by weight zwitterionic surfactant, from about 10 to about 50 percent by weight cationic surfactant and from about 1 to about 10 percent by weight nonionic surfactant.

8. A foam resulting from incorporation of a gas into the composition of claim 1.

9. Method of fracturing a subterranean hydrocarbon-bearing formation comprising injecting a foam of claim 8 into said formation.

4,796,703

COMPOSITIONS FOR AGGLOMERATING SOLID CONTAMINANTS IN WELL FLUIDS AND METHODS FOR USING SAME

Robert K. Gabel, and Robert E. Law, both of Houston, Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 17, 1987, Ser. No. 86,060
Int. Cl.[4] E21B *37/00, 43/00*
U.S. Cl. 166—312 22 Claims

1. A composition useful for agglomerating solid contaminants in a well fluid comprising:

(a) at least about 10 percent by weight, relative to the total composition weight, of a surfactant comprising amides and glycerides formed by contacting one or more secondary amines selected from the group consisting of Alkyl secondary amines having from 2 to 8 carbon atoms, saturated aliphatic hydroxyl-containing secondary amines having from 2 to 8 carbon atoms, and mixtures thereof with triglyceride fats, triglyceride oils or mixtures thereof; and

(b) a carrier capable of forming a solution with said surfactant and which is substantially insoluble in said well fluid and is selected from the group consisting of alkanolamines having from 2 to 8 carbons, alcohols having from 6 to 24 carbons, fatty acids having 12 to 24 carbons, aliphatic hydrocarbons selected from the group consisting of straight chain hydrocarbons, branched hydrocarbons and cycloaliphatic hydrocarbons having 8 to 20 carbons, aromatic hydrocarbons selected from the group consisting of substituted and unsubstituted benzenes and napthalenes and mixtures thereof.

18. In a process for eliminating drilling mud solids and oil from a well system comprising well bore equipment and surface equipment prior to introduction of a fresh well fluid in which the process comprises:

(a) displacing drilling mud from the well system by circulation therein of a first portion of clean water until most of the drilling mud is removed from the well system;

(b) circulating a treated water mixture comprising an agglomerating composition and a second portion of clean water or brine through the surface equipment and the well bore equipment of the well system to displace therefrom the first portion of the clean water carrying drilling mud;

(c) circulating the treated water mixture in the well system in which the fresh well fluid is to be introduced until substantially all the drilling mud is suspended in the circulated treated water mixture; and

(d) displacing the treated water mixture with fresh well fluid in the parts of the well system receiving the fresh well fluid;

wherein the improvement comprises circulating a treated water mixture containing an agglomerating composition comprising:

(i) at least about 10 percent by weight, relative to the total composition weight, of a surfactant comprising amides and glycerides formed by contacting one or more secondary amines selected from the group consisting of alkyl secondary amines having from 2 to 8 carbon atoms, saturated aliphatic hydroxyl-containing secondary amines having from 2 to 8 carbon atoms, and mixtures thereof with triglyceride fats, triglyceride oils or mixtures thereof; and

(ii) a carrier capable of forming a solution with said surfactant and which is substantially insoluble in said well fluid and is selected from the group consisting of alkanolamines having from 2 to 8 carbons, alcohols having from 6 to 24 carbons, fatty acids having 12 to 24 carbons, aliphatic hydrocarbons selected from the group consisting of straight chain hydrocarbons, branched hydrocarbons and cyclo-aliphatic hydrocarbons having 8 to 20 carbons, aromatic hydrocarbons selected from the group consisting of substituted and unsubstituted benzenes and napthalenes and mixtures thereof.

4,796,704

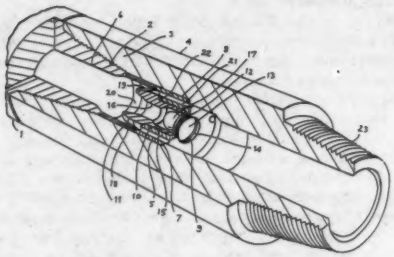
DROP BALL SUB-ASSEMBLY FOR A DOWN-HOLE DEVICE

John Forrest, Aberdeen; William Stewart, New Pigsligo, and Rory Tulloch, Aberdeen, all of Scotland, assignors to Drilex UK Limited, New Pigsligo, Scotland

PCT No. PCT/GB86/00409, § 371 Date Mar. 4, 1987, § 102(e) Date Mar. 4, 1987, PCT Pub. No. WO87/00572, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 15, 1986, Ser. No. 27,231
Claims priority, application United Kingdom, Jul. 19, 1985, 8518218
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—317 9 Claims

1. A drop-ball sub-assembly for down-hole use comprising a

tubular casing (4) defining a flushing fluid flow passage between inlet (3) and outlet (23) ends adapted for coupling at the inlet end (3) to an inlet pipe (1) and at the outlet end (23) to an outlet pipe (24), characterized by a drop-ball (17) supporting member comprising a cylindrical body (8) secured within the casing (4) in the flow passage, at least one aperture (21) extending longitudinally of the cylindrical body through a wall thereof and forming a passage from end to end of said supporting member and arranged to allow fluid flow past the supporting member (8), a further central cylindrical aperture (9) extending through the supporting member (8) and surrounded by said cylindrical body, a blow-out device (13) closing said further aperture and supported by the cylindrical body against movement toward said outlets end (23) of the casing, the blow-out device (13) comprising a disc-like member and supporting a drop-ball (17) of smaller diameter than said further aperture on a side distal from said outlet end (23) against movement towards said outlet end (23), the blow-out device (13) and the apertures (21,9) being such that at a first, lower fluid flow rate from the inlet (3) to the outlet (23) end, fluid flows through said at least one aperture (21) and the blow-out device is retained in and maintains closed the further aperture (9), and that at a second, higher flow rate the blow-out device (13) is blown out of the further aperture to release the ball (17) through the further aperture (9) and said outlet end.



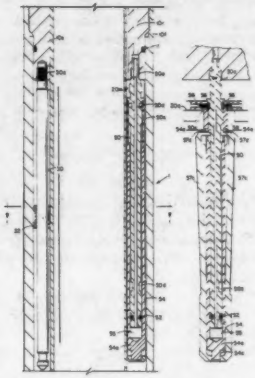
4,796,705

SUBSURFACE WELL SAFETY VALVE

Michael A. Carmody, and Jefferey J. Lembcke, both of Broken Arrow, Okla., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Aug. 26, 1987, Ser. No. 89,522
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—323 **9 Claims**

1. In a valve for controlling the flow in a fluid transmission conduit in a subteranean well comprising a tubular valve housing defining an axial fluid passage, a valve closure member shiftably mounted in said valve housing for movement between an open and closed position relative to said fluid passage, resilient means biasing said valve closure member to said closed position, a valve-actuator sleeve concentrically mounted within said tubular valve housing for axial movements between two positions relative to said valve closure member, in one of said positions holding said valve closure member in said open position and in the other of said two positions permitting said valve closure member to close, and fluid pressure operated means for axially shifting said valve-actuator sleeve to said one position; the improvement comprising: a spindle attached at one end to said housing and disposed in an axially extending position intermediate said valve-actuator sleeve and the axial fluid passage of said tubular housing; means on the other end of said spindle defining a piston; an axially elongated cylinder having a bore slidably and sealably cooperating with said piston and a closed end defining a fluid pressure chamber adjacent said other end of said spindle, said cylinder having a plurality of peripherally spaced ports therein disposed adjacent said one end of said spindle; means for supplying pressured fluid to said fluid pressure chamber, thereby shifting said cylinder axially to abuttingly engage and shift said valve-actuator sleeve to its said one position; and latching means including a collet having a ring portion mounted on the exterior of said cylinder and latching heads projecting through said parts through said cylinder to engage a latching shoulder of said spindle adjacent said position, said latching means being operable between said cylinder and said spindle to secure said valve-actuator sleeve in said one position, thereby locking said valve closure member in its said open position.

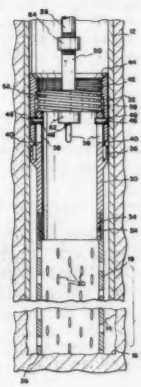


4,796,706

LINER SETTING APPARATUS AND METHOD FOR USE IN WELL CASINGS

Thomas R. Townsend, 1666 Myrtle Ave., Bakersfield, Calif. 93301, and Mitchell Townsend, 7201 Angela Ave., Bakersfield, Calif. 93308

Filed Apr. 4, 1988, Ser. No. 176,962
Int. Cl.[4] E21B *43/10*
U.S. Cl. 166—380 **18 Claims**



16. An apparatus for setting a production liner within a well casing upon the bottom of the well comprising:

an elongated tubular setting sleeve adapted to be mounted on the upper end of said liner;

an annular sealing flange located around the outer diameter of said tubular setting sleeve, the inner diameter of said annular sealing flange being spaced away from the outer

diameter of said tubular setting sleeve except at the bottom of said annular sealing flange, where said annular sealing flange is attached to said tubular setting sleeve,;

a tubular flaring sleeve fitting closely over said outer diameter of the top portion of said tubular setting sleeve, the bottom end of said tubular flaring sleeve being beveled with the bevel facing outwardly, the beveled end of said tubular flaring sleeve flaring said annular sealing flange radially outwardly in a sealing relationship with said well casing when said beveled end of said tubular flaring sleeve is driven downwardly on said tubular setting sleeve; and

tool means for lowering said liner, said tubular setting sleeve, and said tubular flaring sleeve into said well casing.

17. A method of setting a production liner within a well casing upon the bottom of the well comprising:

mounting an elongated tubular setting sleeve on the upper end of said liner, said tubular setting sleeve having an annular sealing flange located around the outer diameter of said tubular setting sleeve at an intermediate portion thereof, the inner diameter of said annular sealing flange being spaced away from the outer diameter of said tubular setting sleeve except at the bottom of said annular sealing flange, where said annular sealing flange is attached to said tubular setting sleeve;

installing a tubular flaring sleeve having an inner diameter sized to fit closely over said outer diameter of the top portion of said tubular setting sleeve onto said top portion of said tubular setting sleeve, the bottom end of said tubular flaring sleeve being beveled with the bevel facing outwardly;

lowering said liner, said tubular setting sleeve, and said tubular flaring sleeve into said well casing; and

flaring said annular sealing flange radially outwardly in a sealing relationship with said well casing by driving said beveled end of said tubular flaring sleeve downwardly on said tubular setting sleeve after said liner, said tubular setting sleeve, and said tubular flaring sleeve have been lowered to the bottom of said well.

4,796,707

APPARATUS FOR SETTING, UNSETTING, AND RETRIEVING A PACKER OR BRIDGE PLUG FROM A SUBTERRANEAN WELL

Floyd A. Halbardier, deceased, late of Pasadena, Tex. (by Anna L. Halbardier, heiress), assignor to Baker Hughes Incorporated, Houston, Tex.

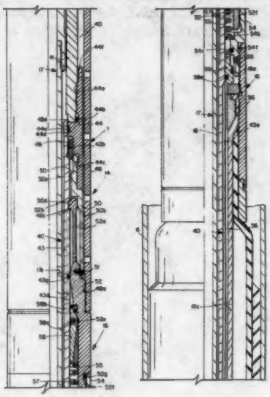
Continuation-in-part of Ser. No. 877,421, Jun. 23, 1986, Pat. No. 4,708,208. This application Oct. 23, 1987, Ser. No. 112,888

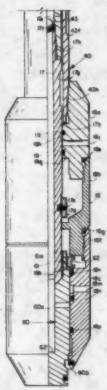
Int. Cl.[4] E21B *33/127*

U.S. Cl. 166—387 **19 Claims**

1. An inflatable packing tool capable of being run in a subterannean well by a remedial tubing comprising, in combination, a radially expandable, tubular elastomeric element, a tubular body assemblage securing each end of said elastomeric element against radial expansion; an elongated mandrel inserted through said tubular body assemblage; axially spaced seal means in said tubular body cooperating with said mandrel in a first axial position of said mandrel to define an annular fluid pressure chamber having the unsecured medial portion of said elastomeric element as an outer wall; said mandrel having peripherally spaced, axially extending recesses in its exterior bypassing said seal means in a second axial position of said mandrel; means for connecting the top end of said mandrel to the bottom end of a remedial tubing for run-in; a collet secured to said tubular body assemblage and having latching heads operatively connected to said mandrel to secure said mandrel in said first position; means for supplying fluid pressure through the remedial tubing to said annular fluid pressure chamber to inflate said medial portion of said elastomeric element into sealing engagement with the well bore when said mandrel is in said first position; means for trapping said fluid pressure in said annular fluid pressure chamber, whereby upward fluid pressure forces on said mandrel are resisted by said collet; a latching sleeve telescopically engaging said collet latching heads to secure same in locking relation to said mandrel and having an upward lost motion connection with said mandrel, and means for elevating said latching sleeve to release said collet latching heads from said mandrel and raise said mandrel to said second axial position to deflate said elastomeric element.

14. The method of setting and retrieving a packing tool in a subterranean well casing partially traversed by a smaller diameter tubing string, comprising the steps of assembling an inflatable packer on an inflation control mandrel having axially spaced inflating and deflating positions relative to the inflatable packer, securing the inflation control mandrel in said inflating





position by a collet on the inflatable packer; connecting the inflatable packer to a connector device having a detachable engagement with a remedial mandrel and an abutting connection with the collet to secure same in locking relation to said inflation control mandrel; lowering the inflatable packer on remedial tubing through the small diameter tubing string to position the inflatable packer at a desired location in the casing below the end of the small diameter tubing string; closing the bore of the inflation control mandrel; applying fluid pressure through the remedial tubing to inflate said inflatable packer into sealing engagement with the casing bore; and subsequently elevating the connector device for first, releasing the collet engagement with said inflation control mandrel, and

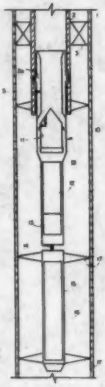
then secondly, elevating the inflation control mandrel to its deflation position, thereby deflating the inflatable packer and then thirdly, retrieving the mandrel and deflated packer to the well surface through the small diameter tubing string.

4,796,708

ELECTRICALLY ACTUATED SAFETY VALVE FOR A SUBTERRANEAN WELL

Jeffrey J. Lembcke, Broken Arrow, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 164,866
Int. Cl.[4] E21B *34/06, 34/16*; G01V *1/40*
U.S. Cl. 166—386 **28 Claims**



1. Apparatus for shifting a downhole tool axially shiftably mounted in a subterranean well conduit for movement between an initial and a second position comprising, in combination: an axially extending actuator connected at one end to said downhole tool; resilient means opposing axial movement of said actuator in the direction away from said initial position; peripheral abutment means on said actuator; shifting means disposed adjacent said actuator; an axial force transmitting member in operative engagement with said shifting means; means for mounting said force transmitting member for non-rotatable axial movement relative to said conduit; an electric motor fixedly mounted in said conduit; and threaded means rotatable by said electric motor and threadably engagable with said force transmitting member to axially shift said shifting means and said actuator in the direction opposed by said resilient means and thereby position the downhole tool in said second position.

14. The method of axially shifting a downhole tool in a subterranean well from an initial position to a second position against the bias of a spring comprising the steps of:

axially shifting the downhole tool to the second position by an electric motor driven gearing mechanism;

supplying power to said electric motor from a downhole battery;

latching the downhole tool in said second position by a solenoid shiftable latch energized by said downhole battery, whereby said downhole tool remains in said second position without energization of said electric motor; and

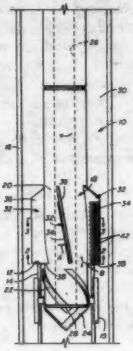
selectively controlling the energization of said electric motor and said solenoid by electromagnetic wave signals transmitted through the earth.

4,796,709

MILLING TOOL FOR CUTTING WELL CASING

Gerald D. Lynde, Bossier City; Kenneth W. Winterrowd, Shreveport, and Harold H. Harvey, Jr., Bossier City, all of La., assignors to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Jan. 6, 1986, Ser. No. 816,287
Int. Cl.[4] E21B *29/00*
U.S. Cl. 166—55.6 **11 Claims**



1. In a cutting tool for cutting a previously installed metal well casing at an open upper end thereof and comprising a body having a lower portion adapted to be received within said casing for rotation about a longitudinal axis; the improvement comprising:

a plurality of blades on the body at spaced intervals about the body and extending outwardly therefrom, each of said blades having a base with a leading surface relative to the direction of rotation, a plurality of metal carbide cutting elements secured to said leading surface of said base in a predetermined generally symmetrical pattern and being of a generally similar size and shape for each blade, each of said cutting elements having an exposed front face, a rear face secured to the leading surface of said base and a peripheral surface extending between said faces defining a relatively sharp lower cutting edge at the juncture of the peripheral surface and front face, the lower cutting edge of each cutting element having a lowermost intermediate portion and adjacent opposed side portions inclined upwardly from said intermediate portion to continually present a relatively sharp cutting surface to the upper end of the well casing;

said cutting elements being positioned on the leading surface of each blade in a plurality of closely spaced parallel rows extending generally outwardly from the axis of rotation and in a plurality of closely spaced parallel columns extending generally along the axis of rotation with each row having at least two cutting elements therein, the front faces and associated cutting edges of the lowermost row of cutting elements defining a lower generally continuous cutting surface which is progressively worn away during the cutting operation;

the lowermost cutting elements forming a lower cutting surface biting into said upper end of the casing in a cutting action to remove metal turnings from said upper end upon rotation of the cutting tool, the lowermost row of cutting elements and adjacent base being worn away along a generally horizontal plane as the cutting operation continues with the next successive row of cutting elements then engaging the upper end of the casing in a continuous cutting action.

4,796,710
GLASS BULB FOR SPRINKLER HEADS

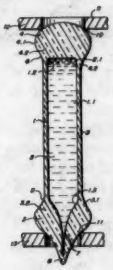
Eduard J. Job, Hansdorfer Strasse 14, 2070 Ahrensburg, Hamburg, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,158

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532042

Int. Cl.[4] A62C *37/08*

U.S. Cl. 169—38 **14 Claims**



1. An elongate thermally responsive glass bulb to carry a mechanical load applied endways between opposing seats of a sprinkler head or the like, comprising,

an elongate one piece glass envelope having integrally formed end portions and a tubular column therebetween and defining an elongate sealed chamber, the elongate envelope including an elongate tapered end tip extending endways of the elongate envelope,

and a quantity of expansible breaking liquid substantially filling said sealed chamber and being responsive to increased temperatures to rupture the glass envelope at said tubular column,

said end portions having endways facing seating areas for engaging the sprinkler head seats, one end portion of the envelope having an outer periphery smoothly tapering divergently progressively endways from a portion of the tubular column and toward the seating area, said one end portion having a diameter in excess of a diameter of the tubular column, said one end portion having a thickness of glass inwardly of said tapering outer periphery to the sealed chamber, said thickness smoothly increasing to larger dimension also progressively endways toward the seating area.

4,796,711
APPARATUS FOR REMOVING PLASTIC FILM FROM RAISED PLANT BEDS

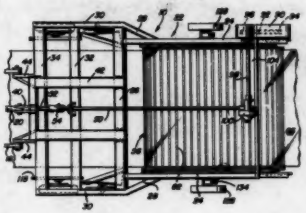
Ralph W. Chrysler, Alva, Fla., assignor to Row Runner Corp. of America, Alva, Fla.

Continuation-in-part of Ser. No. 722,140, Apr. 11, 1985, abandoned. This application Jun. 27, 1986, Ser. No. 879,469

Int. Cl.[4] A01D *33/08*

U.S. Cl. 171—1 **10 Claims**

1. The method of separating a plastic film mulch from a raised plant or seedbed after the plants have matured and the produce crop harvested in which the plastic film has downwardly inclined side edges tucked under soil placed thereon to hold the film in place during the growing and harvesting season, said method consisting of the steps of forming longitudinal slits in the soil surface alongside the side edges of the plastic film and raised plant bed, positioning a blade in a downwardly and laterally inwardly inclined relation under each side edge of the film and partially into the inclined side edges of the raised plant bed, elevating and conveying the plastic film and a substantial portion of the raised plant bed and conveying it rearwardly at a speed equal to the forward speed of the elevating and conveying mechanism while substantially maintaining the shape of the raised plant bed to enable the tuck soil on top of the side edges of the plastic film to be maintained on the side edges of the plastic film and discharging the raised plant bed, plastic film and tuck soil from the rear of the conveying mech-



anism with the tuck soil falling off the film with the with the plastic film then being substantially free of soil on the upper surface thereof to facilitate removal without hindrance from soil on the upper surface of the plastic film.

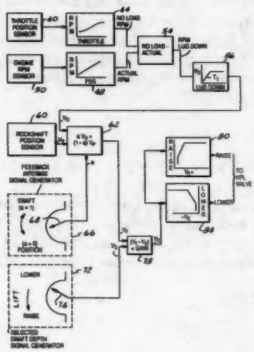
4,796,712
DRAFT LOAD CONTROL SYSTEMS

David J. Rutkowski, Grosse Ile; Wendell J. Ver Ploeg, West Bloomfield, and Larry I. Ross, Lake Orion, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 3, 1987, Ser. No. 92,813

Int. Cl.[4] A01B *63/112*

U.S. Cl. 172—7 **9 Claims**



1. A method for adjusting the depth of a draft implement propelled by a vehicle having an internal combustion engine, comprising the steps of:

sensing the throttle position of said engine;

comparing a stored rpm value representative of a zero engine load condition at said sensed throttle position to an actual rpm measurement of said engine;

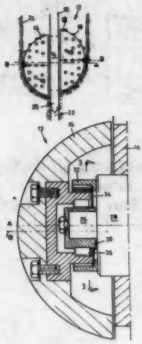
generating a draft load signal representative of the draft load exerted by said implement said draft load signal being determined by said step of comparing rpm values; and

generating an error signal by comparing a reference value representative of a desired implement depth to said draft load signal, said error signal providing a command for adjusting the depth of said implement.

4,796,713
ACTIVATED EARTH DRILL

Ulrich W. Bechem; Klaus Bechem, and Philip C. Bechem, all of Tiefendorfer Str. 87, D-5800 Hagen, Fed. Rep. of Germany

Filed Apr. 14, 1987, Ser. No. 38,212
Claims priority, application Switzerland, Apr. 15, 1986, 1465/86
Int. Cl.[4] E21B 4/04, 4/16
U.S. Cl. 175—96 10 Claims

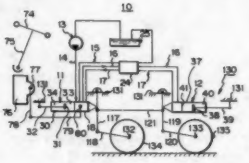


1. An activated earth drill assembly comprising, an elongated drill rod having an upper portion and a lower portion and defining a longitudinal axis, a drill bit attached to the lower portion of the drill rod, the drill bit including a drive arrangement having two opposed drive shafts which extend outwardly away from the drill rod, each shaft defining an axis of rotation, means for rotationally driving the drive shafts, about its axis of rotation and a rock comminuting cutter eccentrically mounted on each drive shaft for rotation therewith, the eccentric mounting providing for both rotational movement of each cutter about the respective axis of rotation and movement of the cutter upwardly and downwardly in a direction generally perpendicular to the axis of rotation as each cutter is rotated by the respective drive shaft.

4,796,714
POWER STEERING SYSTEM FOR USE IN LARGE VEHICLE

Fujio Momiyama, Hino, Japan, assignor to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,304
Claims priority, application Japan, Nov. 30, 1985, 60-270455
Int. Cl.[4] B62D 5/06, 5/08
U.S. Cl. 180—143 7 Claims



1. A power steering system for use in a large vehicle, comprising:

a main booster for steering a pair of steering knuckle spindles swingably connected to opposite ends of an axle;

an auxiliary booster for compensating the steering power of said main booster;

hydraulic pump means for supplying hydraulic oil;

a main hydraulic line for connecting said main booster to said hydraulic pump;

an auxiliary hydraulic line branching off from said main hydraulic line and connecting said auxiliary booster to said hydraulic pump;

a control valve disposed in said main hydraulic line for connecting said main and auxiliary boosters to said hydraulic pump and having a reaction chamber, a pump port, a tank port, a pair of power cylinder ports which are interchangeably connected to said pump and tank ports, and a reaction pressure supply port and a reaction pressure relief port each communicating with said reaction chamber;

a reaction pressure supply passage for connecting the delivery side of said hydraulic pump to said reaction pressure supply port of said control valve;

a reaction pressure supply-side variable throttle disposed in said reaction pressure supply passage;

a reaction pressure relief passage for connecting the suction side of said hydraulic pump to said reaction pressure relief port of said control valve;

a reaction pressure relief-side variable throttle disposed in said reaction pressure relief passage;

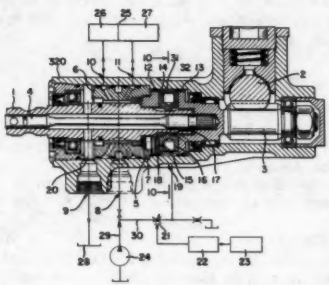
a controller for opening and closing said reaction pressure supply-side and reaction pressure relief-side variable throttles in response to a signal transmitted from a vehicle speed sensor; and

a load sensing valve disposed in said auxiliary hydraulic line and operable to activate and deactivate said auxiliary booster in response to the load of said main booster.

4,796,715
HYDRAULIC PRESSURE REACTION DEVICE IN A POWER STEERING DEVICE

Takeshi Futaba, and Masahiko Noguchi, both of Yao, Japan, assignors to Koyo Jidoki Kabushiki Kaisha, Nara, Japan

PCT No. PCT/JP86/00105, § 371 Date Oct. 27, 1986, § 102(e) Date Oct. 27, 1986, PCT Pub. No. WO86/05152, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 932,734
Claims priority, application Japan, Mar. 1, 1985, 60-41499; Mar. 18, 1985, 60-52442
Int. Cl.[4] B62D 6/02, 5/04, 5/00
U.S. Cl. 180—143 16 Claims



1. A hydraulic pressure reaction device for a steering system to assist a steering mechanism for a vehicle by a hydraulic pressure power device, comprising: an input shaft remotely interconnected to a steering handle; an output shaft having a pinion which engages with a rack; a torsion rod for relatively and torsionally interconnecting said input shaft and output shaft to each other; valve bodies constituting a rotary valve means which surrounds said input shaft and cooperates with said input shaft; and interconnecting means which functionally interconnects said output shaft and valve bodies for rotating

said valve bodies together with said output shaft to constitute a single rotary assembly; said rotary valve means being actuated based on an angular directional deviation between the input shaft and said valve bodies created by relative torsional displacement between said input shaft and output shaft, said hydraulic pressure power device being controlled by said rotary valve means, said rotary assembly including a sleeve portion which surrounds said input shaft, said sleeve portion having a plurality of holes radially passing therethrough and being mutually connected to each other by annular ditches, said rotary assembly including plunger members mounted in said respective holes, said input shaft having a plurality of slots which engage with said respective plunger members on an outer periphery of the input shaft, said each plunger being supplied with hydraulic pressure corresponding to a speed of said vehicle and being forcibly contacted with each of said slots to operate said hydraulic pressure reaction device, said slots extending in an axial direction of said input shaft and having a bottom and a pair of slant surfaces which slant in circumferentially opposite directions of the input shaft to create gaps between said plunger and each slant surface when a center of each plunger circumferentially coincides with a center between the pair of slant surfaces of the corresponding slot.

4,796,716

AUTOMATIC SPEED CONTROL SYSTEM FOR MOTORCYCLES

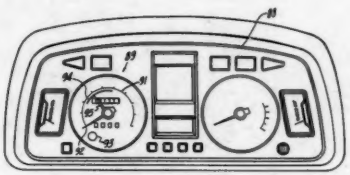
Yutaka Masuda, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 645,494, Aug. 29, 1984, Pat. No. 4,645,027. This application Nov. 13, 1986, Ser. No. 930,231

Claims priority, application Japan, Aug. 31, 1983, 58-160037

Int. Cl.[4] B60K *31/08, 31/18*

U.S. Cl. 180—176 **9 Claims**



1. In an automatic speed control for a vehicle comprising throttle means for controlling vehicle speed, operator control means for selectively positioning said throttle means, and automatic speed control means operable between an off condition for operator controlled vehicle speed and on condition for operating said throttle means to operate the vehicle at a preset speed, the improvement comprising means for indicating actual speed of vehicle travel when the automatic speed control means is in its off condition and for indicating the preset speed when the automatic speed control means is in its on condition.

4,796,717

INSTALLATION FOR THE FORWARD DRIVE REGULATION IN MOTOR VEHICLES

Heinz Leiber, Oberriexingen; Hans Ohnemueller, Reutlingen, and Klaus Kastner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

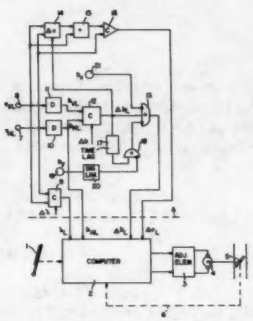
Filed Dec. 23, 1987, Ser. No. 136,956

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644134

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **6 Claims**

1. An installation for the forward drive regulation in motor vehicles in the sense of a reduction of the undesired slippage of its driven vehicle wheels, comprising a first regulating circuit means coordinated to each driven wheel and responding to the slippage of a respective driven wheel in relation to the velocity of the non-driven wheel on the same vehicle side, said first regulating circuit means being operable to effect a reduction of the output torque of a drive aggregate of the motor vehicle when said wheel exceeds a slippage threshold value and for increasing the output torque of the drive aggregate when said wheel drops below the slippage threshold value, and a second regulating circuit means coordinated to each driven wheel which replaces the first-mentioned slippage regulating circuit means at least during the first regulating cycle or for a predetermined duration, said second regulating circuit means being operable to reduce the output torque of the drive aggregate



when the acceleration of the driven wheel exceeds the acceleration that of the non-driven wheel of the same vehicle side by a predetermined amount and including means for storing the difference between the wheel circumferential velocity of the driven wheel and of the non-driven wheel of the same vehicle side which exists at the instant of the beginning of the torque reduction, means for adding the stored value to the wheel circumferential velocity of the non-driven wheel, whereby said summing value forms a threshold value, and said second regulating circuit means being operable to increase the output torque of the drive aggregate again after the wheel circumferential velocity of the driven wheel has dropped below said threshold value.

4,796,718

DRIVE SLIP CONTROL SYSTEM FOR A MOTOR VEHICLE

Christoph Thielen, Wiesenstr. 2, 3423 Bad Sachsa, and Franz Nagler, Am Zehntgrafen 12, D-8729 Gädheim/Ottendorf, both of Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 891,255

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528389

Int. Cl.[4] B60K *23/00, 28/00, 31/00*

U.S. Cl. 180—197 **6 Claims**

1. A system for controlling the drive slip of a motor vehicle driven wheel driven by an internal combustion engine through a change-speed gear having multiple gear settings and a friction clutch arranged in a torque transmission path between the internal combustion engine and the change-speed gear, comprising

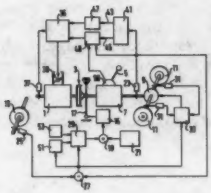
(a) a first rotation rate sensor which generates a first rotation rate signal corresponding to the rotation rate of the driven wheel,

(b) a second rotation rate sensor which generates a second rotation rate signal corresponding to the rotation rate of a non-driven wheel of the motor vehicle,

(c) a controllable servo-drive means for engaging and disengaging the clutch and

(d) means responsive to the first and second rotation rate

signals for controlling the servo-drive means of the clutch for displacing the clutch in a clutch release direction when the first rotation rate signal represents a rotation rate higher by at least a pre-determined difference from the rotation rate represented



by the second rotation rate signal, and for displacing the clutch in a clutch engagement direction when the rotation rates represented by the first and the second rotation rate signal differ by less than the pre-determined difference.

4,796,719

MOTORCYCLE WITH FAVORABLE AIR CLEANER LAYOUT

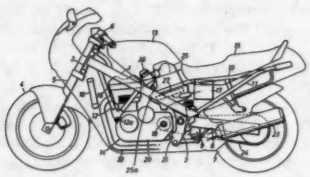
Koji Shiratsuchi, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 85,765

Claims priority, application Japan, Aug. 21, 1986, 61-195781

Int. Cl.[4] B62D *61/02*

U.S. Cl. 180—219 **18 Claims**



1. A motorcycle, comprising a power unit including an engine having a substantially vertically disposed cylinder and a transmission extending rearwardly from a lower part of the engine; a fuel tank arranged above the power unit; and a seat arranged behind the fuel tank; further comprising:

an air cleaner unit accommodated in a space defined by a rear surface of the engine and an upper surface of the transmission;

an upper part of the air cleaner unit protruding into a concave bottom surface of a rear part of the fuel tank;

the air cleaner unit comprising a casing, an air inlet provided in a lower part of the air cleaner casing, a vertical and upward flow passage, an air outlet which extends from an upper part of the air cleaner casing and is connected to an intake port of the engine by way of a passage which is slanted downwards as it extends to the intake port of the engine.

4,796,720

FOUR-WHEEL STEERING, LEVELING AND BANKING FOR VEHICLES

John K. Bauer, 510 Lenox Ave., Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 99,395, Sep. 21, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 142,642

Int. Cl.[4] B62D *5/00, 17/00;* B60G *17/00*

U.S. Cl. 180—234 **9 Claims**

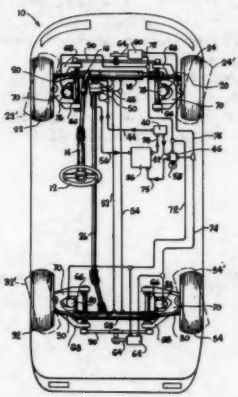
1. A vehicle having a steering wheel, a frame, left and right front wheels, and left and right rear wheels, said frame having a longitudinal axis and a transverse axis, comprising,

a front steering means operatively linked to a steering wheel for turning left and right front wheels in response to rotation of said steering wheel,

a rear steering means operatively linked to said steering wheel for turning left and right rear wheels in response to rotation of the steering wheel,

front camber adjustment means operatively linked to said front wheels for transmitting rotary rotation to said left and right front wheels, said front camber adjustment means including a left suspension arm attached to the left front wheel and a right suspension arm attached to the right front wheel, said left and right suspension arms each pivotally connected to a vehicle frame opposite the associated wheel, said front camber adjustment means being responsive to a fluid working medium to cause rotary motion of aid front wheels relative to the longitudinal axis of the vehicle frame,

rear camber adjustment means operatively linked to said rear wheels for transmitting rotary motion to said left and right rear wheels, said rear camber adjustment means including a left suspension arm attached to the left rear



wheel and a right suspension arm attached to the right rear wheel, said left and right suspension arms each pivotally connected to the vehicle frame opposite the associated wheel, said rear camber adjustment means responsive to a fluid working medium to cause rotary motion of said rear wheels relative to the longitudinal axis of the vehicle frame,

attitude adjustment means connecting said front and rear wheels to said vehicle frame for controlling the distance between a wheel and said vehicle frame, said attitude adjustment means actuated by a fluid working medium,

supply means for providing said fluid working medium,

valve means for directing fluid flow of said fluid working medium between said supply means on the one hand and said front and rear adjustment means and said attitude adjustment means of the other hand, and

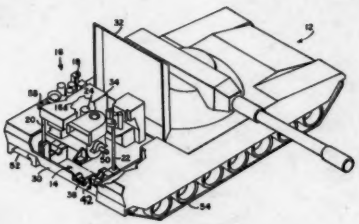
a pendulous mass pivotally suspended from said vehicle frame and operatively connected to said valve means for regulating the orientation of each wheel, said pendulous mass disposed to pivot in response to the magnitude of lateral acceleration of a vehicle and in response to the vertical position of the right front and rear wheels relative to the left front and rear wheels.

4,796,721

SYSTEM FOR DISPLACING A POWER PACK FROM A VEHICLE

Malcolm H. Knapp, Lynnfield, and Gerhard Sonder, Manchester, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jul. 6, 1987, Ser. No. 70,751
Int. Cl.[4] B60K *1/00, 5/10*
U.S. Cl. 180—294 **38 Claims**



22. The system for displacing a power pack component of a vehicle from a compartment in said vehicle comprising:

means for releasably mounting said component in said vehicle;

means for displacing said component from an initial first position to a displaced second position;

means for sensing attitude variations of said component; and

means for controlling said displacing means in response to said sensing means for maintaining said component in a selected attitude from said first position to said second position.

4,796,722

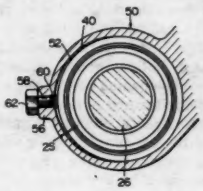
DRIVE SHAFT APPARATUS FOR TRANSVERSE ENGINE VEHICLE

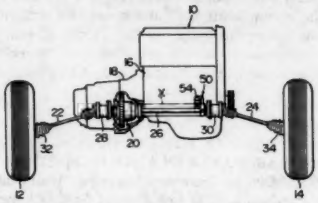
Tadanobu Kumagai, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1987, Ser. No. 8,322
Claims priority, application Japan, Feb. 21, 1986, 61-24910[U]
Int. Cl.[4] B60K *17/24*
U.S. Cl. 180—297 **1 Claim**

1. A drive shaft apparatus for a transverse engine vehicle having an intermediate shaft, a bracket secured to an engine block and having a through hole formed therein, first and second drive shafts equal in length and respectively connected at respective first ends thereof to first and second wheels through first and second velocity joints, the first of said drive shafts being connected at a second end thereof through a third velocity joint to a first output side of a differential unit offset from the center of said vehicle in the transverse direction thereof, the second of said drive shafts being connected at a second end thereof through a fourth velocity joint to a first end of said intermediate shaft which is connected at a second end thereof to a second output side of said differential unit, a bearing attached to an intermediate portion of said intermediate shaft and inserted into said through hole formed in said bracket secured to said engine block,

said drive shaft apparatus comprising an opening portion formed in said bracket in the radial direction thereof, said pressing means having an elastic body, said pressing means being fitted into said opening portion from the outside thereof for pressing the outer peripheral surface of said bearing against the inner peripheral surface of said through hole and for preventing an excessive force acting on an outer race portion of the bearing and for preventing said outer race portion from being rotated relative to the bracket so that said outer race portion can be properly positioned wherein said opening portion comprises a single opening portion having a threaded hole and said pressing means comprises a single elastic body and a single bolt





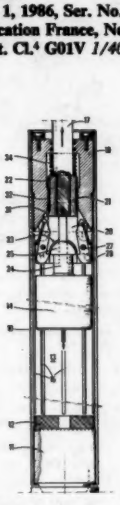
such that play exists between an inner surface of said through hole of said bracket and said bearing.

4,796,723

SYSTEM FOR TRANSMITTING ENERGY THROUGH AN APPARATUS USABLE FOR SUBSOIL PROSPECTION, LOWERED INSIDE A WELL OR DRILL HOLE

Jean Laurent, Oregeval; Charles Naville, Massy, and Rene Paterna, Pechabou, all of France, assignors to Institut Francais du Petrole & Compagnie Generale De Geophysique, Rueil-Malmaison, France

Filed Dec. 1, 1986, Ser. No. 936,618
Claims priority, application France, Nov. 29, 1985, 85 17832
Int. Cl.[4] G01V *1/40*
U.S. Cl. 181—102 **4 Claims**



1. A system for providing energy to a seismic source adapted to be lowered in a deep wellbore, the system comprising a rigid elongated hollow body provided with at least one inner cavity

communicating with an outside of the body through an opening, mobile means linearly displaceable in said at least one inner cavity including a rod adapted to slide through said opening in the elongated hollow body and sealing means for isolating an interior of the body from the deep wellbore, traction on said mobile means through said rod providing for a sliding thereof in the elongated hollow body and the accumulation of energy within said elongated hollow body, releasable anchoring means for coupling said elongated hollow body to walls of the wellbore, a rigid column secured to said rod, and drive means outside the wellbore for linearly pulling the rigid column when the elongated hollow body is coupled to the walls of the wellbore, said seismic source comprising generating means disposed within said elongated hollow body,

wherein said mobile means includes a piston rigidly connected with said rod and adapted for sealingly sliding in at least one chamber upon traction on said rigid column in said at least one chamber containing a hydraulic fluid, a hydraulic accumulator and valve means for accumulating hydraulic fluid pressurized by the sliding of said piston whereby the seismic source provided with the releasable anchoring means can be hydraulically energized.

4,796,724

PROCESS AND DEVICES FOR PRODUCING PRESSURE - OR SHEAR-WAVES IN A SOLID MEDIUM

Gerhard Bohn, Munich; Guenter Steinmetz, Train, and Ulf Steenbeck, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

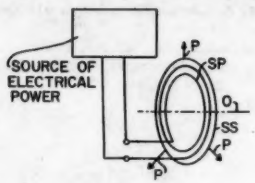
PCT No. PCT/DE85/00368, § 371 Date Jun. 6, 1986, § 102(e) Date Jun. 6, 1986, PCT Pub. No. WO86/02169, PCT Pub. Date Apr. 10, 1986

PCT Filed Oct. 7, 1985, Ser. No. 878,957

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436829

Int. Cl.[4] G01V *1/40*

U.S. Cl. 181—106 **13 Claims**



1. A method for introducing a force through a wall of a bore hole in a solid medium by applying mechanical impulse forces to said bore hole wall having a central longitudinal bore hole axis, comprising the following steps:

(a) rigidly connecting at least one short-circuited secondary coil with at least one expansion fold to said bore hole wall for introducing said impulse forces to the surroundings of said bore hole directly through said short-circuited secondary coil,

(b) arranging primary coil means inside said short-circuited secondary coil in said bore hole in a position for cooperation with said short-circuited secondary coil to form a transformer for generating a magnetic field repelling said short-circuited secondary coil from said primary coil means for introducing said force into said solid medium,

(c) passing a current of short-duration through said primary coil means for energizing said primary coil means to produce said impulse forces which constitute repulsion forces between said primary coil means and said short-circuited secondary coil, and

(d) directly transmitting said repulsion forces through said short-circuited secondary coil into said solid medium.

4,796,725

ELECTROSTATIC TRANSDUCER

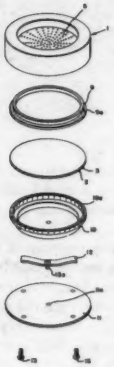
Susumu Katayama, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 849,133, Apr. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 416,657, Sep. 10, 1982, abandoned. This application Dec. 4, 1987, Ser. No. 129,969

Claims priority, application Japan, Sep. 14, 1981, 56-144902

Int. Cl.[4] H04R *19/00*

U.S. Cl. 181—142 **7 Claims**



1. An electrostatic transducer comprising:

a casing having with a front opening and a rear opening;

a fixed electrode extending across the front opening;

a vibration membrane extending over the fixed electrode in surface contact therewith;

a movable electrode extending over the vibration membrane in surface contact therewith for causing the vibration membrane to vibrate when an electric signal is applied between said fixed electrode and the movable electrode and for producing an electric signal in relation to said fixed electrode in response to the vibrating membrane being vibrated; and

a back cover closing said rear opening to enclose said vibration membrane and said movable electrode between the fixed electrode and the back cover;

and further characterized in that:

said fixed electrode is exposed on its surface opposite to the movable electrode to define thereat a sound emitting and receiving surface and is concavely shaped with respect to said exposed surface;

said fixed electrode terminates at its periphery at an inner periphery of said front opening of said casing and is provide in its inner surface opposite to the exposed surface with a plurality of depressions which are arranged concentrically with a center of the fixed electrode; and

said fixed electrode is further provided with a plurality of through openings corresponding only to the plurality of depressions to allow sound to pass through the fixed electrode to and from the vibration membrane.

4,796,726

ULTRASONIC RANGEFINDER

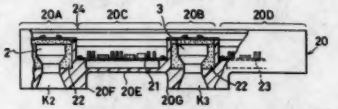
Hiroshi Kobayashi, Yokohama, and Hiroaki Obayashi, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 737,937, May 28, 1985, Pat. No. 4,739,860. This application Nov. 6, 1987, Ser. No. 117,807

Claims priority, application Japan, May 29, 1984, 59-107559; May 29, 1984, 59-107560; May 29, 1984, 59-77919[U]

Int. Cl.[4] G01S *15/00*; H05K *5/00*; H04R *7/00*

U.S. Cl. 181—123 1 Claim



1. An ultrasonic rangefinder for measuring the distance between the rangefinder and an object, said rangefinder comprising:

means for transmitting an ultrasonic wave toward the object and having a transmitting surface;

means for receiving an ultrasonic wave reflected from the object and having a receiving surface;

a casing having two cavities for housing said transmitting and receiving means, respectively, and provided with a signal-processing unit for processing signals supplied from the transmitting and receiving means to measure the distance between the rangefinder and the object, said signal-processing unit being disposed in a concave portion formed in a connecting section between the transmitting and receiving means; and

a foaming insulator having an independent cell structure and covering the interior walls of at least one of said cavities whereby ultrasonic waves from the transmitting means are prevented from directly propagating to the receiving means through the interior of the casing.

4,796,727

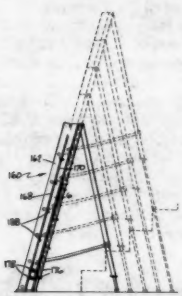
FOLDING STEP LADDER

Earl V. Eaton, Box 1162, Eagle, Colo. 81631

Filed Feb. 1, 1988, Ser. No. 151,008

Int. Cl.[4] E06C *1/22*

U.S. Cl. 182—168 20 Claims



1. A folding step ladder comprising:

a ladder having at least a pair of opposed side leg portions having inner and outer surfaces;

at least three spaced apart steps extending between and fixedly connected to said inner surfaces of said side leg portions and having an upper surface for supporting an user;

said ladder having a top end portion, a bottom end portion, a front side and a back side, a length equal to the longitudinal extent of each of said side leg portions, a width equal to the distance between said outer surfaces of said side leg portions and a depth extending between said front side and said back side;

at least a pair of support legs each having a top end section and a bottom end section;

pivot means for pivotally mounting said top end sections of said pair of support legs on said ladder at said top end portion thereof so that said pair of support legs may be pivotally moved to an opened or closed position, said pair of support legs each pivoting about an axis extending in a depthwise direction and generally parallel to each other;

said pair of support legs having support feet at the bottom thereof and when said pair of support legs have been moved to said opened position, said support feet are spaced apart a distance greater than said width of said ladder;

at least one additional support leg having a top end section and a bottom end section;

pivot means for pivotally mounting said top end section of said additional support leg on said ladder at said top end portion thereof so that said one additional support leg may be pivotally moved to an opened or closed position, said one additional support leg pivoting about an axis extending generally in a widthwise direction.

4,796,728

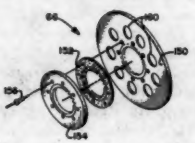
BRAKE NOISE REDUCTION SYSTEM

Glenn G. Kanengieter, Owatonna, and David E. Stomberg, Faribault, both of Minn., assignors to Austoft Inc. (U.S.A.), Owatonna, Minn.

Continuation of Ser. No. 859,472, May 5, 1986, abandoned. This application Jul. 10, 1987, Ser. No. 73,399

Int. Cl.[4] F16D *65/12*

U.S. Cl. 188—18 A 9 Claims



1. A brake system for a vehicle having separate independently driven transmission for reducing noise during at least non-braking operation of the transmission comprising:

a plurality of brake disc assemblies mounted for rotation about a common axis, each brake disc assembly being loosely splined to a shaft drivingly connected to one of said transmissions;

each brake disc assembly including a rigid brake disc plate and a rigid retainer plate spaced from the brake disc plate in non-continuous relationship and a resilient disc secured between the rigid brake disc plate and the rigid retainer plate for noise reduction with the brake disc plate being relatively larger in diameter than the retainer plate and resilient disc and further with the rigid brake disc plate, the resilient disc and the rigid retainer plate being individually directly splined to the shaft;

a caliper assembly associated with said brake disc assemblies, said caliper assembly including a transverse bore and longitudinal slots receiving the brake disc plates;

a stop associated with one end of the bore of said caliper assembly;

a slidable plunger disposed in the other end of the bore of said caliper assembly;

a plurality of brake pucks slidably disposed in the bore of

said caliper assembly between said plunger and said stop, and on opposite sides of each brake disc; and

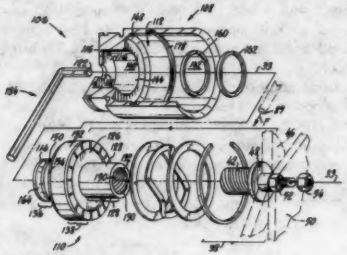
means for cam-actuating said plunger to compress said brake pucks on said brake disc assemblies to arrest movement of said transmissions.

4,796,729

DISC BRAKE SYSTEM

Marco Viscogliosi, 31 Lenox Ave., Pleasantville, N.Y. 10570

Filed Aug. 12, 1987, Ser. No. 84,924
Int. Cl.[4] F16D *55/02, 55/26*
U.S. Cl. 188—71.7 34 Claims



1. A brake system for a motor vehicle connected to a brake fluid pressure system and including calipers positioned around a wheel disc and an emergency brake apparatus, including, in combination,

a housing mounted to the vehicle proximate a wheel, said housing including a housing mounting portion holding said calipers and a housing enclosed portion having a housing chamber having an axis,

outer piston means positioned in said housing chamber for exerting pressure against said calipers, said outer piston being axially aligned with and movable along said axis, said outer piston means having a first actuating area,

inner piston means positioned in said outer piston for moving said outer piston means from an inactivated position to a selected activated position so as to create pressure against said calipers and said disc, said inner piston means having a second actuating area in pressure contact with said first actuating area, said inner piston means being rotatable about said axis and movable along said axis,

actuating screw means positioned in said housing chamber for providing rotational and axial movement movement for said inner piston relative said outer piston means, said actuating screw means also being operatively connected to the emergency brake apparatus,

fluid chamber means in said housing chamber operatively connected to the brake fluid pressure system, said fluid chamber means being for containing brake fluid of the brake fluid system so that fluid pressure can be exerted against said inner piston when the brake fluid brake system is activated so as to rotate and axially move said inner piston means relative said actuating screw means,

return means for moving said outer piston from said selected activated position to said inactivated position when the brake fluid system is deactivated,

pressure means for maintaining said inner piston means in contact with said outer piston means and for initiating movement of said inner piston means from said inactivated position towards said selected activated position upon activation of the brake fluid system, and

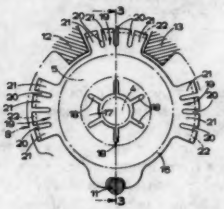
pressure relief means associated with said inner piston means for axially rotating and moving said inner piston means from contact with said outer piston means at said first and second actuating areas, wherein said outer piston means can be subsequently moved inwardly into the housing without resistance.

4,796,730

SELF-ENERGIZING DISC BRAKES

Anthony G. Price, Gwent, Wales; Roy Campbell, Worcestershire, England, and Eric Henson, Gwent, Wales, assignors to Lucas Industries, Ltd., Birmingham, England

Filed Jan. 13, 1987, Ser. No. 3,056
Claims priority, application United Kingdom, Nov. 6, 1986, 8626522
Int. Cl.[4] F16D *55/02, 65/78*
U.S. Cl. 188—71.6 7 Claims



1. A self energizing disc brake comprising a housing, first and second axially spaced braking surfaces in said housing, radial pilot lugs and a drag-taking stop abutment in said housing, an actuator mechanism comprising first and second pressure plates centered on said pilot lugs, adjacent faces of said pressure plates being provided with co-operating oppositely inclined angularly spaced recesses, and rolling bodies located in complementary pairs of said recesses, at least one rotatable friction member disposed between each said pressure plate and an adjacent said braking surface, each said friction member comprising a disc, and first and second linings of friction material for engagement with said pressure plate and said braking surface carried by opposite faces of said discs, said linings having outer peripheral edges, and said pressure plates being movable angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge said friction members into engagement with said braking surfaces due to a tendency for said rolling bodies to ride up ramps defined by said end faces and constituting camming means, said plates being carried round with said discs until one of said plates is arrested by the engagement of a lug on that plate with said drag-taking stop abutment, whereafter continued angular movement of the other of said plates provides a servo action, wherein an intermediate spacer disc is disposed between adjacent linings of a pair of said friction discs on one side of said actuator mechanism, and said intermediate disc comprising a metal plate of which the area is greater than the area of each said lining, means keying said plate to said housing against rotation relative thereto, portions of said plate projecting radially with respect to the linings each include a plurality of angularly spaced radial slots, fins which assist cooling being defined between said slots, and wherein each said fin is disposed outwardly of said outer peripheral edges of said linings.

4,796,731

COMPRESSION TYPE TRUCK/TRAILER BRAKE SLACK ADJUSTER

Eugene W. Schmitt, Lockport, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

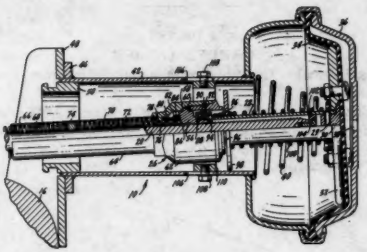
Filed Apr. 24, 1987, Ser. No. 42,295
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.
Int. Cl.[4] F16D *65/38, 65/56*
U.S. Cl. 188—196 D 2 Claims

1. A combination in-line brake slack adjuster and air cham-

ber including an air chamber housing, a diaphragm movable in said housing, a piston movable in said housing and attached to said diaphragm, a return spring positioned within said air chamber and urging said piston, and diaphragm to a brake release position,

an air chamber housing extension, a slack adjuster coaxially positioned within said housing extension and having relatively movable telescoping members, one of which is attached to said piston the other of said telescoping members adapted to be attached to a brake operating member, brake force applying spring means coaxially positioned about said other telescoping member and urging said telescoping members in opposite directions,

a clutch disc rotatably mounted on said other of said telescoping members and first and second spaced clutch surfaces on said one of said telescoping members, said clutch disc interconnecting said telescoping member for relative movement therebetween to take up and let out slack to



maintain a generally uniform piston travel during brake application movement, movement of said clutch disc from said first clutch surface to said second clutch surface during brake application movement of the piston contracts said slack adjuster, with movement, during brake release, of said clutch disc from said second clutch surface to said first clutch surface lengthening said slack adjuster,

and a thrust assembly including a thrust plate coaxial with said telescoping members and a thrust spring also coaxial with said telescoping members, with said thrust spring, through said thrust plate, urging said clutch disc into contact with said first clutch surface, a stop on said air chamber housing extension, contact between said thrust plate and said stop, during brake application movement, removing the pressure of said thrust spring upon said clutch disc to permit movement thereof to said second clutch surface, whereby said slack adjuster becomes rigid between the piston and the brake operating member.

4,796,732

PISTON CYLINDER TYPE OIL DAMPER

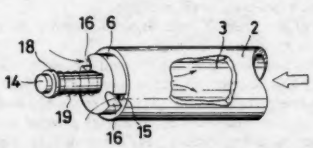
Alan Kong, Kawasaki, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jul. 7, 1987, Ser. No. 70,739

Claims priority, application Japan, Jul. 10, 1986, 61-160926

Int. Cl.[4] F16F 9/19, 9/50

U.S. Cl. 188—282 **2 Claims**



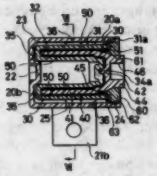
1. An elongation type oil damper comprising a closed cylinder having a bore containing oil, a hollow plunger having an inner end sealingly and slidably fitted in said cylinder bore and also containing oil in a hollow space thereof, said plunger including an outer end projecting from a rod end of said cylinder and being movable through an elongation stroke and a contraction stroke, said plunger being provided through the end face of said inner end with a plurality of communication holes through which the oil in said hollow space and the oil in said cylinder bore join each other, said holes providing the only path of fluid communication between said bore and said hollow space, said plunger including an axial extension at said inner end projecting into said bore, said extension comprising a stem fast therewith projecting from said plunger's inner end into said bore, a single axially floating valve located between said cylinder bore and at least some of said communication holes and axially slidable relative to and retained by said stem of said axial extension, said valve being movable axially for closing at least one but less than all of said communication holes during a contraction stroke of said plunger and for opening said communication holes during an elongation stroke of said plunger, a floating piston axially movable within said hollow space of said plunger and sealing the outer end of said plunger, and spring means in said plunger connected to said plunger's outer end for resiliently biasing said floating piston toward said inner end of said plunger, said valve further comprising a valve element slidably disposed on said stem, said element being biased toward the front surface of said plunger by spring means situated between said valve element and annular ring mounted on said stem, said holes of said plunger being located so as to intersect an inner end face and said plunge, said valve element being engageable with said plunger face for closing certain of said holes, and said valve element including a notch therein aligned with at least one of said holes of said plunger for avoiding closing said one hole.

2. An elongation type oil damper comprising a closed cylinder having a bore containing oil, a hollow plunger having an inner end sealingly and slidably fitted in said cylinder bore and also containing oil in a hollow space thereof, said plunger including an outer end projecting from a rod end of said cylinder and being movable through an elongation stroke and a contraction stroke, said plunger comprising a slide section in direct sliding contact with the inner periphery of the cylinder and comprising an axially extending, cylindrical projection which projects into the cylinder, said projection having a reduced diameter thus radially spaced from the inner periphery of said cylinder and said projection being open at the front, an axially, single floating valve movable directly in the inner periphery of the cylindrical projection provided with a plurality of circumferentially spaced, deformed check pawls, the cylindrical projection provided at its rear inner end between said projection and slide section with a plurality of large holes through which the oil in said hollow space and the oil in said cylinder bore join each other, the valve including a constantly or continously open, small axial central through-hole, the large holes and through-hole providing the only path of fluid communication between said bore and said hollow space, the axially floating valve located between said bore and at least some of said communication holes and axially slidable relative to and retained by said axial projection, said valve being movable axially for closing said large communication holes during an elongation stroke of said plunger, a floating piston axially movable within said hollow space and sealing the outer end of said plunger, and spring means in said plunger connected to said plunger's outer end for resiliently biasing said floating piston toward said inner end, said valve being disposed in said cylindrical projection in axial sliding contact with the inner periphery of the cylindrical projection such that the valve is retained by said check pawl means, the valve being tapered toward the slide section to engage a corresponding tapered surface of said slide section acting as a seat for said valve to close the large holes thus permitting fluid flow communication only through the small axial constantly or continuously open through-hole in the floating valve.

4,796,733
OIL DAMPER

Hironichi Nakayama, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Aug. 3, 1987, Ser. No. 80,833
Claims priority, application Japan, Aug. 5, 1986, 61-183786
Int. Cl.[4] F16D 57/02
U.S. Cl. 188—291 8 Claims



1. An oil damper for braking a rotor shaft, comprising:

a tubular case open at one end thereof and having first engagement means formed upon an inner peripheral surface portion thereof;

an intermediate rotor including inner and outer cylinders integrally formed together wherein said inner cylinder extends coaxially from one end of said outer cylinder, so as to project into said outer cylinder, with a diametrical extent less than that of said outer cylinder so as to define an annular space which is open at the other end of said outer cylinder, an outer peripheral portion of said outer cylinder being provided with second engagement means for engagement with said first engagement means of said tubular case whereby said intermediate rotor is disposed within said tubular case such that it is rotatable in only one direction without being stopped by engagement of said first and second engagement means while being prevented from rotating in the opposite direction by engagement of said first and second engagement means, and wherein the open end of said annular space of said intermediate rotor corresponds to the open end of said tubular case;

a shaft rotor having a tubular section open at one end thereof for rotatable accommodation within said annular space of said intermediate rotor; a transverse wall closing an opposite end of said tubular section of said shaft rotor; and rotor shaft socket means, open at one end thereof while having the other end thereof closed by said transverse wall, extending in an axial direction opposite that of said tubular section, relative to said transverse wall, for receiving said rotor shaft to be braked; and

oil sealed within said annular space defined between said inner and outer cylinders of said intermediate rotor for providing adequate resistance with respect to the relative movement defined between said intermediate rotor and said shaft rotor.

4,796,734
TOTEABLE SHADED HEADREST

Shawn M. Distasio, P.O. Box 60794, Sacramento, Calif. 95860-0794

Filed Mar. 11, 1988, Ser. No. 166,629
Int. Cl.[4] A45C 3/10
U.S. Cl. 190—1 5 Claims

1. A toteable shaded headrest comprising:

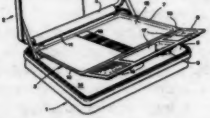
a cloth covered frame work structured in three panel sections attached by adjustable hinging at converging corners in a manner to form a head shade panel, a support panel, and a base panel with said panels sufficiently sized for human head and shoulder coverage when said base panel is in a horizontal head rest position, said support panel is vertically inclined as a header, and said head shade panel is positioned in horizontal alignment with said base panel, there being manual means for tightening and loosening said adjustable hinging with said frame work structure being foldable into a carrying package with carrying handles affixed, there being multiple capped pouches in outwardly facing surfaces of said panels, and there being side extending flaps affixed to said shade panel for added

shading and for a carrying package retainer when said frame work structure is folded, said shade panel and said side extending flaps affixed with cooperative means for attachment and detachment.

4,796,735
CARRYING CASE

Yutaka Horiuchi, 910, 100 Eighth Avenue, Kitchener, Ontario, Canada N2C 1S3

Continuation-in-part of Ser. No. 837,071, Mar. 6, 1986, Pat. No. 4,694,940. This application May 4, 1987, Ser. No. 45,456
Int. Cl.[4] A45C 3/02, 13/00, 13/04, 13/26
U.S. Cl. 190—109 11 Claims



1. A carrying case, which comprises a body (1), a tray (3), and a lid (2), characterized:

in that the lid is separate from the tray (3);

in that the lid is pivotably attached to a back wall (12) of the body (1);

in that the tray is pivotably attached to the said back wall;

in that the body includes side-walls and a front-wall which, together with the back-wall, define a well-shaped compartment (14) in the body;

in that the tray (3) includes a main-portion (7) and a flap-portion (8), the portions being connected by a flap-hinge (10), which permits relative pivoting movement therebetween;

in that the axis of the flap-hinge is spaced from the said back wall of the body;

in that the axis (11) about which the tray is pivotable, and the axis about which the lid is pivotable, and the axis of the flap hinge, are all three parallel;

in that the flap-portion (8) is smaller than the main-portion (7);

in that the main-portion (7) is rigid;

and in that the tray (3) can be set selectably to all these positions relative to the body:

(a) a closed position, in which the said two portions (7,8) of the tray (3) lie over respective parts of the well-shaped compartment (14), the tray (3) being so shaped and dimensioned as to substantially close at least a major part of the well-shaped compartment (14) when set in the closed position;

(b) a wide-open position, in which both portions (7, 8) are displaced away from the well-shaped compartment (14), leaving the well-shaped compartment wide open;

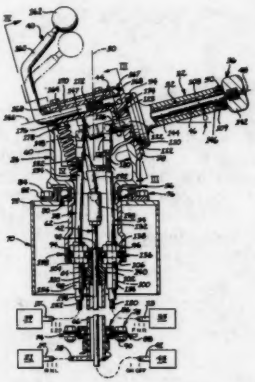
(c) and a partially-open position where the main-portion (7) lies over, and substantially closes, a part of the well-shaped compartment (14), and where, simultaneously, the flap-portion (8) lies open enough relative to the body (1) to permit access into the well-shaped compartment.

4,796,736

CONTROL MECHANISM FOR APPLYING A BRAKE AND NEUTRALIZING A TRANSMISSION OF A VEHICLE

David M. Fee, Groveland, and Craig W. Riediger, Pekin, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 30, 1987, Ser. No. 139,889
Int. Cl.[4] B62D *11/04*; G05G *9/00*; F16H *57/10*
U.S. Cl. 192—4 C **11 Claims**



1. A control mechanism for applying a brake and operating a transmission of a vehicle having an element mounted on the vehicle for limited rotational movement about an upstanding axis, comprising:

actuator means for controlling the transmission and movement of the vehicle and including a transmission actuating member mounted on the element and being limitedly rotatable about a second axis between a plurality of operating positions and a neutral position; and

brake and neutralizer means for simultaneously restricting movement of the vehicle by applying the brake and urging the transmission actuating member to the neutral position, the brake and neutralizer means including a brake actuating member mounted on the element and being limitedly rotatable about a third axis between a brake-off position and a brake-on position, and cam means for positioning the transmission actuating member to the neutral position in response to movement of the brake actuating member to the brake-on position, the cam means being directly mechanically connected to the brake actuating member.

4,796,737

CLUTCH AND LOCK MECHANISM

D. Kevin Tyler, Hebron, Ky., assignor to Litton Industrial Automation Systems, Inc., Hebron, Ky.

Filed Mar. 13, 1987, Ser. No. 25,639
Int. Cl.[4] F16D *67/02*
U.S. Cl. 192—18 R **9 Claims**

1. A clutch and lock mechanism comprising:

a first shaft rotatable about an axis of rotation;

a first shaft ring assembly fixedly coupled to said first shaft;

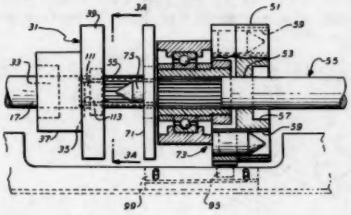
a second shaft rotatable about said axis of rotation;

a second shaft ring assembly fixedly coupled to said second shaft,

said first and second shafts and said first and second shaft ring assemblies being spaced one from the other; and

an engaging mechanism positioned between said first and second shaft ring assemblies and laterally movable along said axis of rotation between said first and second shaft ring assemblies,

said engaging mechanism including first and second portions which are rotatable relative to one another and laterally fixed relative to one another,



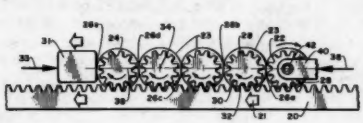
wherein one of said second portion of said engaging mechanism or said second shaft ring assembly includes at least one axially extending locking pin and the other of said second portion of said engaging mechanism or said second shaft ring assembly includes at least one receptacle complementary to said locking pin adapted to mate therewith for rotationally locking said second portion of said engaging mechanism to said second shaft ring assembly.

4,796,738

CONTROLLABLE CLUTCH

Gregory M. East, Santee, Calif., assignor to J. C. Pemberton, La Mesa, Calif., a part interest

Continuation-in-part of Ser. No. 857,218, Apr. 30, 1986, abandoned. This application May 13, 1987, Ser. No. 50,791
Int. Cl.[4] F16D *13/00*, *15/00*, *43/00*
U.S. Cl. 192—20 **16 Claims**



1. A clutch for selectively clutching and declutching a first member and a second member, comprising:

a rail on said first member;

a plurality of clutch rollers each in the form of a circular surface of revolution mounted for rotation about clutch roller axes transverse of said rail;

said clutch roller axes being disposed on a clutch roller line substantially paralleling said rail;

said clutch rollers being movable toward and away from each other;

coupling means for coupling said rail and said clutch rollers for applying a rotative torque to said clutch rollers about their respective said axes, upon relative movement between said first member and said clutch rollers whenever said members are in a declutched condition;

bunching means for causing said clutch rollers to bunch frictionally together and bind against rotation, thereby to lock said first member and said clutch rollers together, and including:

control means distinct from said first member for selectively causing a control clutch roller at one end of said clutch roller line to move toward and contact the adjacent clutch roller; and

load means including a load clutch roller disposed at the other end of said clutch roller line, and coupled to said second member for transmitting a load between said members, thereby clutching together said members.

4,796,739

CLUTCH ACTUATION DEVICE

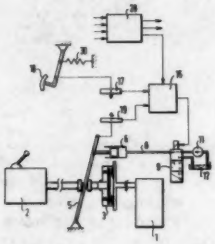
Wolf-Dieter Jonner, Beilstein, and Jurgen Zechmann, Heilbronn, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 62,991

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630750

Int. Cl.[4] F16D *67/04*

U.S. Cl. 192—13 R **4 Claims**



1. A clutch actuation device for a vehicle comprising an actuating operative element to engage and disengage a clutch (3) in response to output signals from an electronic control unit (28), a clutch pedal (18), a first sensor (17) which determines an extent of depression of said clutch pedal (18) and sends a measurement signal whose magnitude depends on the position of said clutch pedal (18) to the electronic control unit (15), a further sensor (19), which sends another measurement signal to the electronic control unit (15) which depends on the position of a clutch actuation element (5) of said actuating operative element, said electronic control unit (15) produces an output signal depending upon a set value input associated with said first sensor (17) and by a second actual value input associated with said further sensor (19), which output signal is directed to a fluid pressure control valve (9), and said vehicle is equipped with a brake locking protection control system (LPCS) controllable via a regulating unit (28), which includes a signal transmission device which, when a brake locking protection function is present, supplies an additional signal produced in the regulating unit (28) to said electronic control unit (15) and in response thereto, said control valve 9 is switched to permit fluid flow to operate a piston of said clutch actuation element (5) which disengages said clutch (3) in which, upon simultaneous receipt of a measurement signal from said sensor (17) and an additional signal from said regulating unit (28), said electronic control unit (15) forms an output signal which is the same as it would form if only the additional signal from the regulating unit (28) were present.

4,796,740

FLYWHEEL ASSEMBLY

Hirotaka Fukushima, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

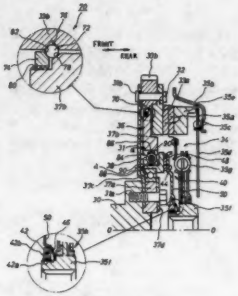
Filed Feb. 10, 1987, Ser. No. 13,292

Claims priority, application Japan, Feb. 18, 1986, 61-34793; Feb. 18, 1986, 61-34794

Int. Cl.[4] F16F *15/12, 15/30*

U.S. Cl. 192—30 V **5 Claims**

1. A flywheel assembly including a first flywheel fastened to an engine crankshaft and engaged and disengaged by a clutch disc, a second flywheel concentrically supported with respect to the first flywheel and rotatably connectable to a spline hub of the clutch disc via a friction damping mechanism, wherein the second flywheel comprises a damper inertial part and a damper hub resiliently coupled together by a torsion damper mechanism, and wherein the friction damping mechanism comprises a friction plate rotatably connected to the spline hub



of the clutch disc, a friction member fixed to the friction plate which presses against a pressure surface provided on the damper hub only when the clutch disc engages the first flywheel and a spring member positioned between the friction plate and the spline hub to urge the friction plate and the friction member toward the second flywheel.

4,796,741

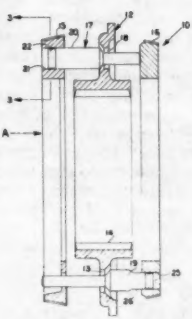
SYNCHRONIZER BLOCKER PIN MOUNTING STRUCTURE

John M. Loeffler, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 11, 1987, Ser. No. 131,559

Int. Cl.[4] F16D *23/08*

U.S. Cl. 192—53 E **10 Claims**



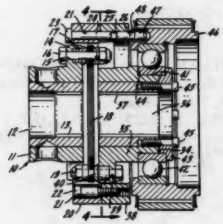
1. In a synchronizer assembly, a sychronizer friction ring and blocker pin subassembly characterized in that said blocker pin has a cylindrical shoulder thereon external of said friction ring, said friction ring has a cylindrical bore coaxial with said blocker pin and from about 0.0005" to 0.0015" smaller than said cylindrical shoulder, an extension of said cylindrical shoulder being pressed into said bore, a chordally extending groove in said bore, and a cross pin pressed into said chordally extending groove to lock said blocker pin in said bore.

4,796,742

FLEXIBLE CLUTCH DRIVE PULLEY ASSEMBLY

Gordon Etchell, Downers Grove, Ill., assignor to Pathfinder Graphic Associates Inc., Justice, Ill.

Filed Jun. 19, 1987, Ser. No. 63,816
Int. Cl.[4] F16D *11/00, 3/60*
U.S. Cl. 192—67 P 7 Claims



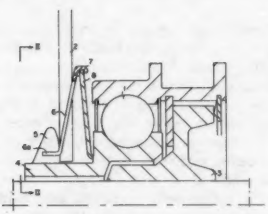
1. A flexible clutch drive pulley assembly including:
(a) a first half coupling connected to a drive shaft;
(b) a second half coupling connected to a driven shaft;
(c) a flexible connection between said half couplings accommodating misalignment between said drive shaft and said driven shaft;
(d) a bearing member mounted on said second half coupling;
(e) a pulley drum mounted for rotation on said bearing member;
(f) a slide ring mounted upon the periphery of said first half coupling for rotation therewith;
(g) a retractable drive connecting means carried by said ring and projecting into receptacles provided by said pulley drum for operatively connecting said pulley drum to said ring and said first half coupling for rotation therewith.

4,796,743

CLUTCH RELEASE BEARING ASSEMBLY

Stig Hallerback, Vastra Frolunda, Sweden, assignor to AB SKF, Gothenburg, Sweden

Filed May 8, 1987, Ser. No. 47,656
Claims priority, application Sweden, May 14, 1986, 8602185
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 1 Claim



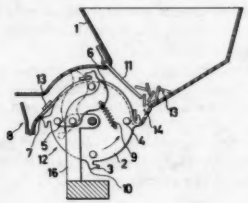
1. A clutch release bearing assembly adapted to be connected to a cup spring member of a coupling, said bearing assembly comprising a bearing including an inner race ring having a generally cylindrical portion (4), said spring member (2) having a plurality of radially inwardly directed tongues having spaces therebetween, a plurality of radially outwardly extending projections (5) circumferentially spaced about the periphery of the cylindrical portion (4), the circumferential spacing of said projections (5) being such that they correspond to the spaces between said radial tongues and of a size to be axially displaceable therethrough, an annular member (7) having a plurality of circumferentially spaced catch fingers (6) each having a terminal end portion (6*a*) which extends axially in a first direction and is engageable in a respective space between the projections (5) and normally positioning the catch fingers to prevent relative rotation of said spring member (2) and cylindrical portion (4) wherein the tongues are aligned with the projections (5), said catch fingers being displaceable axially toward said bearing in a second direction opposite said first direction to a point where the terminal end portions (6*a*) disengage said spaces between said tongue to permit relative rotation of said spring member (2) and cylindrical portion (4) to a position where the tongues are aligned with the spaces between the projections (5) to permit disassembly of said bearing assembly from spring member (2) in said second axial direction.

4,796,744

APPARATUS FOR SEPARATING TEST STRIPS

Hans D. Sänger, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,661
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625697
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—397 1 Claim



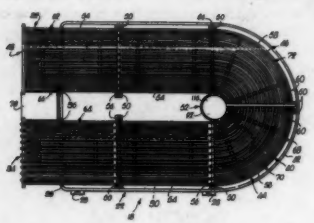
1. An apparatus for separating test strips, comprising:
a supply container for receiving a plurality of test strips randomly disposed therein, said supply container having an exit orifice;
a transport device, closely associated with said exit orifice, for separately transferring said test strips from said exit orifice to a guide chute, said transport device including a rotatably mounted roller plate and at least one hook-shaped driver extending from the periphery thereof, said hook-shaped driver defining a slot for receiving one of said test strips therein and for carrying said test strip from said exit orifice to said guide chute;
a pivotable bar, having a free end extending into said exit orifice, for selectively feeding said test strips into said exit orifice and for preventing blocking of said exit orifice;
said at least one hook-shaped driver of said roller plate having a nose portion configured to engage said bar as said roller plate is rotated to pivotably move said free end of said bar;
pawl means, pivotably mounted adjacent to said roller plate, for moving said test strip received in said slot of said driver toward said guide chute, and at least one bolt-like projection, extending from said roller plate, for pivoting said pawl means as said roller plate is rotated; and
return means, operably connected to said pawl means, for biasing said pawl means toward an initial position.

4,796,745

CONTINUOUS CONVEYING APPARATUS

Marshall Long, 11147 Old Harbour Rd., North Palm Beach, Fla. 33408

Division of Ser. No. 802,705, Nov. 29, 1985, Pat. No. 4,686,894.
This application Aug. 6, 1987, Ser. No. 82,835
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] B65Q *47/24*
U.S. Cl. 198—407 10 Claims



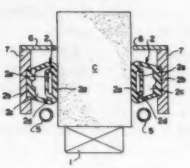
1. Conveying apparatus comprising:
a U-shaped, primary grid, presenting a pair of elongated, spaced legs and a bight having a pair of separate, arcuate sections;
conveyors for advancing items successively along one of said pair of legs, one of said arcuate sections, the other of said accurate sections and the other of said pair of legs,
said one of said accurate sections being higher than said other of said arcuate sections whereby the items invert as they fall from the one of said arcuate sections to the other of said arcuate sections at a zone of inversion and thereafter travel upside down,
said conveyors including a U-shaped secondary grid shiftable intermittently up and down relative to the primary grid for raising the items off the primary grid, said secondary grid having a pair of elongated, spaced legs corresponding to the legs of the primary grid and a pair of separate, arcuate, bight sections corresponding to said bight sections of the primary grid.

4,796,746

DEVICE FOR BRAKING ARTICLES TO BE CONVEYED ON A CONVEYER AND BRAKING RUBBER TUBES THEREFOR

Anders Bergstrom, and Gösta Sevrell, both of Lund, Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Nov. 12, 1987, Ser. No. 119,645
Claims priority, application Japan, Nov. 13, 1986, 61-270397
Int. Cl.[4] B65G *47/29*
U.S. Cl. 198—463.4 4 Claims



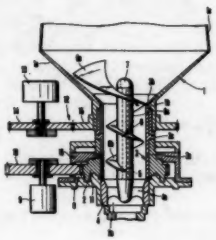
1. A device for braking articles conveyed on a conveyor comprising:
a pair of side walls extending along said conveyor;
a pair of inflatable rubber tubes of a predetermined length with flat braking surfaces adjacent said articles and along said conveyor, said rubber tubes being provided on the inside of said pair of side walls such that said articles on said conveyor can pass between said rubber tubes;
a means for inflating said pair of rubber tubes such that both sides of said articles are engaged by said rubber tubes when said rubber tubes are inflated; and
guide members for guiding said articles, said guide members being provided adjacent an upper portion of each of said pair of side walls and a lower portion of each of said rubber tubes.

4,796,747

FOODSTUFF DELIVERY MACHINE

Tokuji Kajiwara, Tokyo, Japan, assignor to Kajiwara Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1987, Ser. No. 24,415
Claims priority, application Japan, Mar. 14, 1986, 61-37337
Int. Cl.[4] B65G *47/20*
U.S. Cl. 198—535 7 Claims



1. A foodstuff delivery machine for use with delicate food products, such as bean jam, and for delivering the delicate food products without subjecting the delicate food product to undue compression forces, the delivery machine comprising:
a fixed machine frame;
a hopper rotatably supported on said fixed machine frame and having a lower tapered end portion;
a feed sleeve rotatably supported on said fixed machine frame and having an upper end rotatably connected to the lower tapered end portion of said hopper and a lower end communicating with an outer side of said fixed matching frame;
an upstanding stationary shaft fixed to said fixed machine frame;
a helical delivery blade fixedly secured to said stationary shaft and having a first helical blade portion fitted in said feed sleeve and a second helical blade portion fitted in the lower tapered end portion of said hopper, said second helical blade portion being continuous with said first helical blade portion and having a larger outer diameter;
a first drive mechanism arranged externally of said feed sleeve for rotating said feed sleeve in a given direction at a first speed; and
a second drive mechanism arranged externally of said hopper for rotating said hopper in the same direction as said feed sleeve at a second speed lower than said first speed.

4,796,748

CONTINUOUS BUCKET CONVEYOR SYSTEM

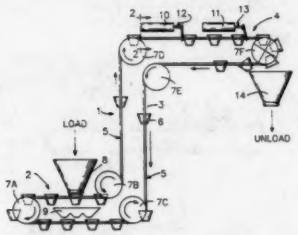
William Manning, Burnaby, Canada, assignor to C-I-L Inc., North York, Canada

Filed Oct. 5, 1987, Ser. No. 104,296
Int. Cl.[4] B65G *17/36*
U.S. Cl. 198—711 1 Claim

1. An endless closed-loop continuous bucket conveyor elevator assembly not requiring internal lubrication comprising in combination:

one or more endless, free-running, guided flexible cables for carrying buckets pivotally attached at equidistantly spaced intervals therealong, said endless cables defining a first substantially horizontal bucket-charging section, a substantially vertical bucket-elevating section and a second substantially horizontal bucket-discharging section, and

driving means for continuously advancing the said cables



and attached buckets, the said driving means comprising at least two hydraulically or pneumatically operated, reciprocally-acting cylinder and piston combinations mounted adjacent the said cables and attached buckets, the said cylinder and piston combinations acting on the forward stroke of each said piston to successively engage one or more contact members attached to the said cables to continuously move the said cables and said buckets in a forward direction.

4,796,749

SPIRAL LINK BELT WITH COMPOSITE HELICES

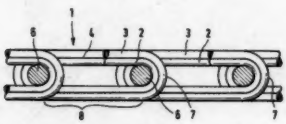
Johannes Lefferts, Enschede, Netherlands, assignor to Siteg Siebtechnik GmbH, Ahau-Alstatte, Fed. Rep. of Germany

Filed Nov. 6, 1987, Ser. No. 120,139

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638036

Int. Cl.[4] B65G *17/06*

U.S. Cl. 198—851 **7 Claims**



1. A spiral link belt comprising a multiplicity of synthetic resin helices comprised of flat winding legs and winding arcs, the winding arcs of a helix meshing in zipper fashion with the winding arcs of adjacent helices, and pintle wires inserted into the channels formed by the meshing winding arcs of each two helices, wherein a plurality of helices are each made of filament material which has at least two components which contact each other along an interface extending along the length of the helix, the helices being wound such that a first component is disposed on the inside of the helix and a second component is disposed on the outside of the helix.

4,796,750

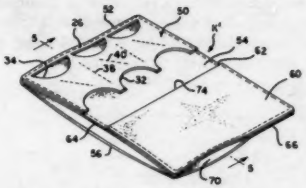
SEPARATE KEYHOLDER APPARATUS AND SAME COMBINED WITH WALLET

Dan Ingbram, Paddock Pl. at Vermont Ave., Toms River, N.J. 08753

Filed Jul. 31, 1987, Ser. No. 79,923

Int. Cl.[4] A45C *11/32*

U.S. Cl. 206—37.4 **5 Claims**



1. A compartmentalized receptacle comprising:

first rectangular means, having four sides, for forming first walls of compartments for keys;

second rectangular means, having four sides, for forming second walls of said compartments for said keys;

said first rectangular means and said second rectangular means being leathery;

three sides comprising two parallel sides and an end side on said second rectangular means, stitched to three sides of said first rectangular means;

a fourth side on said second rectangular means opposite and parallel to said end side;

said compartments delineated by parallel stitching including stitching between said two parallel sides and by diagonal stitching centered between said parallel stitching;

curvedly shaped cuts with secants formed in said second rectangular means symmetrically arranged to said parallel stitching;

said secants delineated by cuts adjacent and parallel to said stitching of said end side and along said fourth side;

fold means bisecting said first rectangular means with said second rectangular means on at least one side of said fold means;

abutment means for limiting travel of said keys out of said compartments comprising said secants delineated by cuts and said fold means.

4,796,751

PORTABLE EYEGLASS CLEANING DEVICE

Catherine M. Madkour, 7117 Fort Hamilton Pkwy., Brooklyn, N.Y. 11228

Filed Mar. 28, 1988, Ser. No. 174,191

Int. Cl.[4] B65D *81/22*

U.S. Cl. 206—223 **12 Claims**

1. A portable kit for cleaning eyeglass lenses which comprises:

a flat container hvaing two separate openable compartments including a first compartment containing an eyeglass lens cleaning media capable of cleaning eyeglass lenses without deteriorating the lens and a second compartment containing an eyeglass lens wiping media capable of wip-

ing eyeglass lenses cleaned by said lens cleaning media without affecting viewing through the lens.

7. A portable eyeglass lens cleaning product comprising:

a flat, flexible container having two separate air-tight openable compartments with a common wall therebetween, a first of said compartments containing a moistened absorbent eyeglass lens cleaning material capable of cleaning eyeglass lenses without deterioriating or adversely effecting the eyeglass lens, and a second of said compartments containing a dry lens wiping material capable of wiping eyeglass lenses cleaned by said lens cleaning material without affecting viewing through the lens.

4,796,752

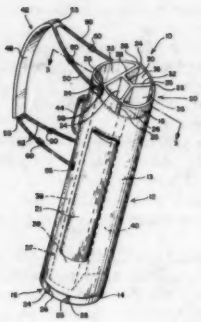
CART BAG FOR GOLF

Eric W. Reimers, 235 N. First St., Missoula, Mont. 59802

Filed Dec. 2, 1987, Ser. No. 127,809

Int. Cl.[4] A63B *55/00*

U.S. Cl. 206—315.3 **16 Claims**



1. A golf bag device, specifically adapted for being carried on a powered or pull type cart device, comprising:

a bag portion generally in the form of an elongated holow cylinder; and

carrying means for enabling a user to lift and carry the bag portion;

wherein, the bag portion includes:

a base plate;

a collar including a peripheral frame and a plurality of apertures formed axially therethrough for receiving the shafts of golf clubs;

a plurality of rigid elongated stays extending axially from the peripheral portion of said base plate to the peripheral portion of said collar, said stays maintaining axial separation between said base plate and said collar;

a flexible tube stretched about the radial exterior of said stays and being attached to said base plate and said collar so as to form therewith said elongated hollow cylinder, with said stays situated within said cylinder; and wherein

the carrying means is in the form of a strap assembly attached both to said collar and to points on one or more of said stays axially displaced from said collar, such that said strap assembly is situated in the rear of the bag, said strap assembly including an upper webbing having a loop which passes through a cross member formed in said collar, a padded portion for receiving the golfer's shoulder during carrying, attached to said upper webbing, and a lower webbing extending downward from said padded portion and being attached to one or more of said stays.

4,796,753

CASING FOR MAGNETIC RECORDING MEDIUM AND PREPARATION THEREOF

Tatsuo Fujii, Saku, Japan, assignor to TDK Corporation, Tokyo, Japan

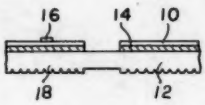
Filed Mar. 14, 1986, Ser. No. 839,534

Claims priority, application Japan, Apr. 5, 1985, 60-51179[U]; Apr. 8, 1985, 60-74129; Jan. 7, 1986, 61-000500[U]; Jan. 8, 1986, 61-001890

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 **2 Claims**



1. A casing for magnetic recording medium having a laminated structure in which a printed plastic film is bonded on one surface of a raw plastic sheet of the same material with its printed surface directing outside and wherein an anchor coating layer compatible with said raw plastic sheet is formed on said printed plastic film, wherein the inner surface of the casing has been modified by a lattice-like embossing treatment.

4,796,754

OPEN-ENDED MULTIPAK WITH CARRYING STRAP AND METHOD

Jean Chaussadas, Deols, and Philippe Le Bras, Chateauroux, both of France, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 4, 1988, Ser. No. 152,267

Claims priority, application United Kingdom, Feb. 10, 1987, 8702976

Int. Cl.[4] B65D *65/00*

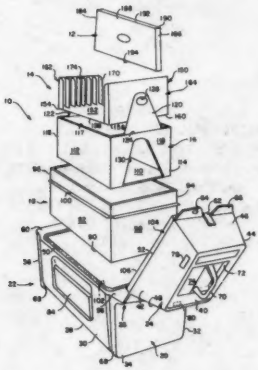
U.S. Cl. 206—434 **14 Claims**

12. A method of forming a package of cylindrical or oval articles comprising a central group of articles and outer groups of articles disposed on both sides of said central group and being held together by first and second securing means, said method comprising the steps of forming a first group of articles and applying thereto a first securing means in the form of a loosely fitting endless band or strap encircling said first group and disposed along the sides of said articles, positioning auxiliary groups of articles one on either side of the central group in abutting nested relationship with respect to the articles in said central group whereby said first securing means is tightened so as to closely embrace the articles in said central group, applying a second securing means to said consolidated groups to maintain the articles of the auxiliary groups in their abutting nested relationship with respect to the articles in said central group.

4,796,755
MEANS AND METHOD OF PROTECTING DATA STORED ON OPTICAL OF MAGNETIC MEDIA OR VARIOUS SIZES AND SHAPES

Angelo M. Ardenti, 10123 Woodbury Dr. Apt. 312, Manassas, Va. 22110

Filed Feb. 3, 1987, Ser. No. 10,531
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—444 32 Claims



1. A magnetic or optical media transporting and storing system adapted to selectively receive magnetic or optical media of various sizes and shapes comprising:

(A) a holder adapted to selectively receive and securely support a multiplicity of individual magnetic or optical media receptacles in at least one arranged row, said holder including

(1) a monolithic disposable element which includes a base having ends and sides and a length as measured between said ends which is essentially equal to but just slightly greater than the longest media receptacle to be carried in said holder, and a width as measured between said sides which substantially exceeds the thickness of any media receptacle to be carried in said holder,

(2) a hinge on each of said base ends,

(3) an end flap connected to each of said hinges to be movable into a position which is substantially upright with respect to said element base to define a U-shape for said disposable element,

(4) a plurality of end flap track forming elements positioned on each of said end flaps with track defining elements in one of said end flaps cooperating with track defining elements in the other of said end flaps to define a plurality of media receptacle receiving tracks for securely supporting said media receptacles on said disposable element;

(B) a container for accommodating said holder, said container including a container bottom and container sides and ends which are attached to said container bottom to form an open-topped configuration, said container being sized so that said holder is removably receivable and securely held in said container;

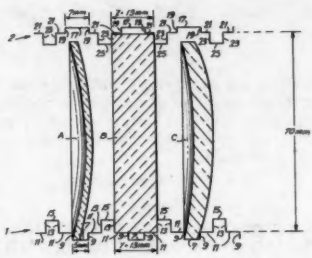
(C) a shield means having a bottom, sides and ends which cooperate to form an open-topped configuration, said shield means being formed of material which prevents magnetic energy from passing therethrough and reaching any objects located within said shield means and being sized to removably receive said container therewithin; and

(D) a carrying case having a bottom compartment forming means which includes a bottom, front and rear sides and ends which cooperate to form an open-topped bottom compartment and a top compartment forming means having top front, rear and end portions which cooperate to form a top compartment, and connecting means for connecting said top compartment forming means to said bottom compartment forming means, said top and bottom compartment forming means each being sized to removably receive and securely hold a shield means and being adapted to cooperate to form a closed carrying case for said media receptacles.

4,796,756
OPTICAL LENS CARRIER

William M. Ott, St. Petersburg, Fla., assignor to Silor Optical of Florida, Inc., St. Petersburg, Fla.

Filed Apr. 11, 1988, Ser. No. 180,225
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—454 13 Claims



1. A lens-carrying device adapted to receive and retain a plurality of optical lenses having a predetermined range of thicknesses in a spaced-apart non-contacting relations, comprising

a first tray having a plurality of longitudinally-spaced side-by-side cavities;

a second tray having a plurality of longitudinally-spaced side-by-side cavities;

said first and second trays being releasably engagable such that the plurality of first tray cavities and plurality of second tray cavities are juxtaposed in mirror relation opposite each other to define a plurality of side-by-side lens-carrying chambers for receiving and retaining a plurality of optical lenses in side-by-side non-contacting relation;

each of said chambers having a central peripheral slot for supporting on edge an optical lens having a thickness up to a first predetermined value, lateral step means adjacent said central peripheral slot for supporting on edge above said central peripheral slot an optical lens having a thickness greater than said first predetermined value and up to a maximum predetermined value and divider means adjacent said lateral means for preventing contact between lenses in adjacent chambers.

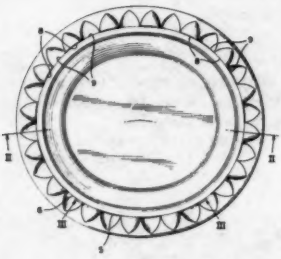
4,796,757
VESSEL

Karl E. Strunkmann-Meister, 40, Clemensstr. 78, F.R.G., 8000 Munich, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 55,887
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1986, 3618507
Int. Cl.[4] B65D *21/00, 85/30*
U.S. Cl. 206—509 33 Claims

1. Vessel comprising vessel components, the vessel component having rims on which profiles are arranged such that the profiles of two vessel components positioned one on the other and facing each other, interlock positively, the profiles being elevations and depressions having an arc shape in a cross-sec-

tion parallel to the rim, the elevations protruding from the rim in a cross-section along the longitudinal direction of the elevations, and the depressions merging into the rim in a cross section along the longitudinal direction of the depressions, the



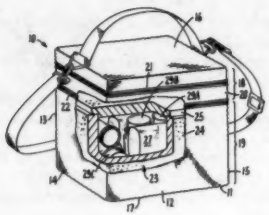
profiles having on one end cheeks essentially perpendicular to the rim and at their remaining sides steplessly merging into the rim, the surfaces of the cheeks being essentially perpendicualr to a connecting line between a center of the vessel component and a center of the cheeks.

4,796,758

ASSEMBLY FOR STORAGE, TRANSPORTATION AND CHILLING OF EXPRESSED HUMAN MILK

David Hauk, 183 Florence Ave., Oakland, Calif. 94618

Filed Sep. 2, 1987, Ser. No. 92,166
Int. Cl.[4] B65D *81/38*
U.S. Cl. 206—545 **1 Claim**



1. An improved storage assembly for storage, transportation and chilling of expressed human milk comprising:

a plurality of thermally conductive storage bottles each substantially rectangular in horizontal cross-section to provide at least a pair of broad sides for conduction cooling of the contents of said bottles;

a plurality of coolant bags for chilling said storage bottles, said bags positioned in contact with both of the broad sides of at least a plurality of said bottles;

a foam insulated chest having a chamber for housing said bottles and said bags;

said chamber, said storage bottles and said bags dimensioned to provide direct contact between at least a plurality of said bags with at least a plurality of said bottles;

a fitted lid for closing said chamber;

a carrying case having:

a front and a back panel, two sides panels, a top panel and a bottom panel;

a wall panel joined to the front, back and side panels dividing the case into a first compartment containing said chest and a second compartment having capacity to store and transport a breast pump;

a zipper below said wall pump extending around said front and said side panels and portions on opposite sides of said back panel providing access into said first compartment; and

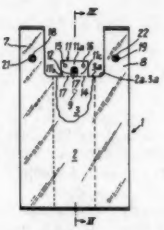
means for providing access to said second compartment.

4,796,759

BUNDLE OF SUPPLE BAGS, MADE OF FINE MATERIAL SUCH AS PLASTICS MATERIAL OR PAPER

Jacques Schisler, Thouars, France, assignor to C.E.E. Compagnie Europeene des Emballages, Thuoars, France

Filed Dec. 29, 1987, Ser. No. 139,306
Int. Cl.[4] B65D *27/10*
U.S. Cl. 206—554 **15 Claims**



1. A bundle of supple bags for carrying articles, in which each said bag comprises:

a front and a rear principal wall defining a volume which presents a bottom and an upper opening;

each said principal wall including a pair of spaced lateral handles having aligned holes therethrough, the superimposed bags of the bundle being adapted to be supported by at least two parallel rods passing through said holes;

said bags being joined in series by a separable connection of each of their two principal walls with the adjacent principal wall of an adjacent bag, in the vicinity of said opening, the assembly being such that the first bag is removed by pulling thereon in the direction of superposition in order to separate the first bag from the following by destroying said connection, such removal being accompanied by a spacing apart of the principal walls of the following bag due to said pulling, wherein the separable connection is constituted by a glued or welded localized zone below the center of the edge of the opening; and

each said bag comprises, above this glued or welded localized zone and between said lateral handles, a single support tongue having an elongated opening and base portions on each side of said elongated opening, said base portions being joined in separable manner to at least one of said principal walls of said bag, considering the direction of removal, the base portions of said tongue being joined to the edge of said one principal wall defining the opening of the bag and forming at least one central hole for the passage of another rod separate and apart from said at least two parallel rods;

said elongated opening defining said central hole terminating at the upper edge of said principal wall to which said base portions are connected.

4,796,760

PACKING CONTAINER PROVIDED WITH OPENING ARRANGEMENT

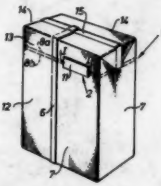
Hans Rausing, Wadhurst, England, assignor to AB Tetra Pak, Lund, Sweden

Filed Feb. 26, 1987, Ser. No. 19,171

Claims priority, application United Kingdom, Mar. 4, 1986, 8605323

Int. Cl.[4] B65D 5/54

U.S. Cl. 206—606 **8 Claims**



1. In a packing container, an opening arrangement comprising:
   - a wall portion having an interior surface and a pair of spaced tearing perforations arranged to define a strip of wall material therebetween;
   - a hole interconnecting said pair of spaced tearing perforations, said strip adjacent said hole being formed as a tongue, said hole being bordered by two edges extending from points of connection of the tongue to the lines of tearing perforations and converging towards a single point, the tongue and the two edges together forming the borders of the hole;
   - a cover strips sealed to said wall portion and extending across said wall strip and over said hole; and
   - a first thin liquid tight plastics film sealed to said interior surface of said wall portion and covering said hole, a portion of the cover strip exposed to the hole being sealed to the immediately underlying plastics film.

4,796,761

MODULABLE OBLIQUE BIN

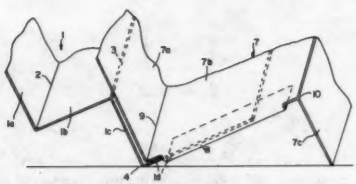
René Hermelin, Trie sur Baïse, France, assignor to Services Equipments France (S.E.F.), Paris, France

Filed Apr. 23, 1984, Ser. No. 603,024

Claims priority, application France, Apr. 22, 1983, 83 06679

Int. Cl.[4] B42F 17/00

U.S. Cl. 211—11 **1 Claim**



1. A series of compartments forming a bin comprising:
   - a container consisting of two parallel vertical walls connected to each other at the lower ends thereof by a horizontal wall;
   - a plurality of obliquely-oriented divider units nested together and disposed within said container, each dividing unit comprising first, second, third and fourth planar sections connected together in series in end-to-end relationship to form a unit having a W-shaped cross-section, with adjacent sections being at right angles to each other and forming inner and outer corners at the intersection of said sections, said first section extending obliquely upward from the horizontal wall and being the longest of the four sections, said second section being next longest, and the third section being the shortest section, the inner corner formed by the intersection of said third and said fourth sections of the units receiving the outer corner formed by the intersection of said first and second sections of the next succeeding divider unit; and
   - a final divider unit nesting against the last of the divider units having a W-shaped cross-section consisting of first, second and third planar sections which are analogous to the first, second and third sections, respectively, of the units having a W-shaped cross-section, said second section of the final divider unit being provided with a pair of lateral guide means for retaining the fourth section of the immediately preceding divider unit against the lower surface of said second section of the final divider unit.

4,796,762

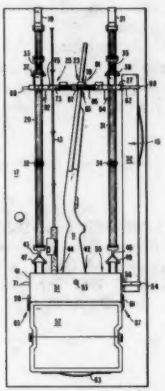
STORAGE RACK

Donel G. Law, R.R. 1, Box 232B, Tipton, Ind. 46072

Filed Jun. 24, 1987, Ser. No. 65,842

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—64 **24 Claims**



1. A storage rack for holding generally elongated gear having an upper and a lower end comprising:
   - a pair of generally vertical suspension members;
   - a first support member at least partially suspended by said suspension members and adapted to receive the lower end of the gear to be stored;
   - a second support member at least partially suspended by said suspension members and adapted to receive the upper end of the gear to be stored; and
   - a fishing tackle box removably suspended below said generally vertical suspension members.

4,796,763

MODULAR DISPLAY

Robert P. Franklin, Lake Hopatcong, and John LaRocca, Fairfield, both of N.J., assignors to Trans-World Marketing Corporation, East Rutherford, N.J.

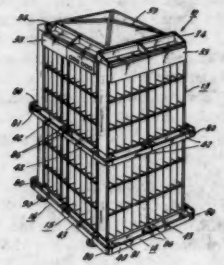
Filed Dec. 16, 1986, Ser. No. 942,525

Int. Cl.[4] A47F 3/14

U.S. Cl. 211—133 **21 Claims**

1. A free standing display rack including:
   - first, second, third and fourth modules each having a generally closed rear, a generally open front and sides extending forward from opposite vertical side edges of said rear;

said first and second modules being secured together in sideways alignment, said third module having a side thereof positioned adjacent to said first module at its said rear with the front of said third module being generally coplanar with a side of said first module remote from said second module, and said fourth module having a side thereof positioned adjacent to said second module at its



said rear with the front of the fourth module being generally coplanar with a side of said second module remote from said first module;

each of said modules including a first pan, a second pan positioned above said first pan and in vertical alignment therewith, a frame having a portion disposed at the rear of said module and having said first and second pans secured thereto.

4,796,764

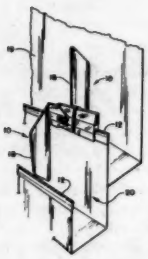
DIVIDER FOR MERCHANDISE DISPLAY

Stephen N. Hardy, Copley, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio

Filed Oct. 22, 1987, Ser. No. 112,668

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—184 **26 Claims**



1. Apparatus comprising a merchandise display including a display wall with display spaces defined on each side of the display wall, and a pair of identical dividers for dividing the display spaces into segments; each of the identical dividers having attachment means for engaging the display wall and a divider tongue extending longitudinally from the attachment means for extending into the display spaces for dividing the display spaces into segments; the attachment means and the divider tongues being designed to enable both divider tongues to extend simultaneously into the display spaces on each side of the display wall at any desired location over the entire length of the display wall.

4,796,765

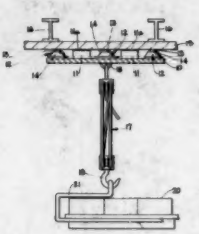
PERMANENT MAGNET TRANSPORTER

Jimmy Mayne, Goshen, Ohio, assignor to Chase Industries, Inc., Cincinnati, Ohio

Filed Sep. 2, 1987, Ser. No. 92,048

Int. Cl.[4] B66C *17/00*

U.S. Cl. 212—205 **10 Claims**



1. A permanent magnet transporter for use with an iron or steel sheet structure having a horizontal downwardly facing supporting surface, said transporter comprising a frame member having upper and lower surfaces, a plurality of bipolar permanent magnets mounted on the upper surface of said frame member so as to project upwardly therefrom and having planar upper surfaces in close proximity to but not in contact with said supporting surface, a plurality of rollers mounted on said upper surface of said frame member and projecting upwardly therefrom into contact with said supporting surface, said rollers permitting movement of said transporter in any direction across said supporting surface, and means connected to the lower surface of said frame member for attachment to and support of a load.

4,796,766

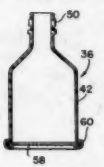
PLASTIC CONTAINER AND METHOD OF FORMING SAME

Richard E. Clark, Merrimack, N.H., assignor to The Continental Group, Inc., Norwalk, Conn.

Filed Apr. 1, 1982, Ser. No. 364,563

Int. Cl.[4] B65D *1/02, 1/06;* B29C *49/16, 49/17*

U.S. Cl. 215—1 C **18 Claims**



1. A method of simultaneously forming two blow molded plastic containers, said method comprising the steps of providing a tubular preform having an open end and a closed end, placing said preform in a blow mold cavity of greater length than said preform, introducing a blowing gas into said preform through said preform open end and blow molding said preform with the stretching of said preform both axially and radially to an intermediate shape defining at least two containers each having an open end defined by a radially outwardly directed biaxially oriented seaming flange with said flanges being generally in opposed relation, said preform open end remaining constant, and cutting said intermediate shape to separate and define said two containers.

11. An intermediate article of manufacture comprising an integral blow molded hollow plastic member having an open

neck portion and at least two separate containers integrally joined together, and each of said containers has an open end defined by a biaxially oriented seaming flange.

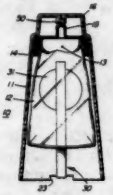
17. A blow molded plastic container comprising a biaxially oriented tubular body having one end open and a second end defined by a shoulder joined to a tubular neck, and a metal bottom seamed to said body enclosing said one open end, said tubular neck being of an injection molded construction.

4,796,767

PRESSURE APPLICATOR

Frank R. McKeown, 1044 Kennedy Road, Scarborough, Ontario, Canada M1P 2K6

Filed Sep. 8, 1987, Ser. No. 93,723
Claims priority, application Canada, Jul. 8, 1987, 541604
Int. Cl.[4] A61J 9/00
U.S. Cl. 215—11.1 **19 Claims**



1. Apparatus for expelling air from a flaccid container carried within a nursing bottle having open ends and a nipple disposed at one end in communication with an outlet of the container, comprising in combination:

a pushrod member with elongated narrow sides adapted to lie unobtrusively along a side wall of the bottle in removably storable relation therewith;

attachment means disposed cooperatively between the bottle and member for detachably fastening the latter at a plurality of positions thereon to the side wall of the bottle; and

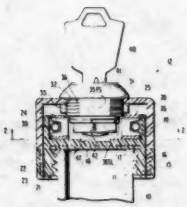
pad means disposed substantially orthogonally at one end of the pushrod member interiorly of the free end of the bottle for supportively engaging an external surface of the container by applying a restraining force thereagainst, whereby the container is collapsed to expel air contained therein when the restraining force is exceeded.

4,796,768

LOCKABLE CLOSURE CAP

William C. Stuckey, 1503 Virginia Street, E., Charleston, W. Va. 25311

Filed Jan. 26, 1988, Ser. No. 148,468
Int. Cl.[4] B65D 55/14
U.S. Cl. 215—207 **6 Claims**



1. A lockable closure for bottles and containers having a neck and external threads formed on said neck,

a closure cap having internal threads coacting with said external threads to seal said bottle, and an annular cylindrical clutch element projecting from integrally formed with said closure cap and rotatable therewith,

an annular shell housing having an annular skirt, said skirt having an axial length equal to or greater than the axial length of said closure cap and enclosing same to prevent external twisting access to said closure cap when engaged with the external threads on said neck,

annular rib means extending from one of said annular shell and said closure cap and a coacting shoulder on the other one of said annular shell and said closure cap for retaining said closure cap within said annular shell, and

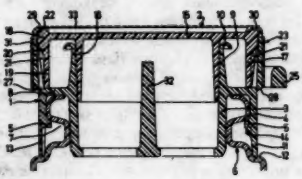
said annular shell housing having a lock receiving wall at one end thereof and a lock mechanism secured in said lock receiving wall, said lock mechanism having laterally movable clutch shoe means operable to extend laterally to drivingly engage and disengage with said annular cylindrical clutch element upon operation of said lock mechanism.

4,796,769

TAMPER-PROOF POURER AND STOPPER CAP ASSEMBLY

Jacques Obadia, Paris, France, assignor to RICAL S.A., Longvic, France

Filed Jun. 22, 1987, Ser. No. 64,561
Claims priority, application France, Jun. 26, 1986, 86 09302
Int. Cl.[4] B65D 41/48
U.S. Cl. 215—232 **17 Claims**



1. A pourer and stopper cap assembly molded from plastic material for bottles and similar receptacles, including in combination

a pourer for fastening to a bottle neck or a similar receptacle orifice, said pourer comprising an inner annular skirt adapted for fitting inside a said neck, an outer annular skirt adapted for fitting outside said neck, and an annular connecting portion joining said two skirts at their upper end, said connecting portion having a spout projecting upwardly from said connecting portion, said spout being substantially an extension of said inner skirt, and

a cap comprising an upper circular end wall and, projecting downwardly from said end wall, an inner annular skirt and an outer annular skirt at the outer edge of said end wall so that when said cap is fitted on said pourer, said cap's inner skirt is forced into said pourer spout and said cap's outer skirt surrounds said spout with its lower end bearing against said connecting portion of said pourer, said end wall of said cap having on its upper face an annular shoulder offset inwardly from the outer edge of said end wall,

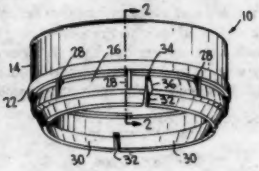
said pourer also having an annular tear-off guarantee strip integrally molded with said pourer, said strip being connected by a peripheral weakening line to said connecting portion of said pourer, said strip extending from said connecting portion upwardly around said cap's outer skirt over the entire height of said cap's outer skirt, and being provided at its upper end, when molded, with an annular turned-in portion which surrounds said outer edge of said end wall of said cap and bears against said annular shoulder of said end wall, the height of said shoulder being at

least equal to the thickness of said guarantee strip at said turned-in portion.

4,796,770
MOLDED PLASTIC CLOSURE WITH SPLIT SKIRT TAMPERBAND

Douglas G. Begley, Palatine, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Oct. 5, 1987, Ser. No. 104,075
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **12 Claims**



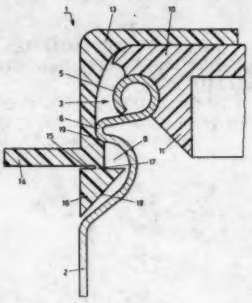
1. A molded plastic closure comprising an inverted cup-shaped part including a skirt and an end panel, means for attachment to a container carried by said skirt, and tamper indicating means carried by said skirt in depending relation, said tamper indicating means including a tamper indicating band permanently hingedly connected to said skirt, for radially outward expansion, said tamper indicating band having formed therein at least one axial line of weakening forming means wherein said tamper indicating band is subject to axial splitting and radial expansion in response to radially outwardly directed forces, and a plurality of separate flaps hingedly connected to said tamper indicating band remote from said skirt, hinge connections between said flaps and said tamper indicating band permitting generally reverse folding of said flaps from a downwardly directed position to an upstanding position whereby free edges of said flaps may engage a retaining bead on a container neck finish and swing towards a transverse intermediate position during removal of said closure hinging said tamper indicating band radially outwardly to permit complete removal of said closure.

4,796,771
SECURITY CLOSURE LID AND CONTAINER PROVIDED WITH SUCH LID

Friedrich Stettler, Hauptstr. 116, 8264 Eschenz, Switzerland

Continuation of Ser. No. 887,241, Jul. 18, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 143,316
Claims priority, application Switzerland, Jul. 18, 1985, 3117/85; Jun. 25, 1986, 2550/86
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—253 **11 Claims**

6. In combination, a container and a lid for the container;
the container having an open mouth and having an annular locking bead around the open mouth;
the lid being shaped for closing the open mouth;
the lid having a peripheral edge; a security strip attached at the peripheral edge, the strip being shaped for passing over the locking bead at the mouth of the container when the lid is applied to the container and for engaging beneath the locking bead for preventing removal of the lid from the container;
the security strip being connected to the lid through a reduced thickness neck which is thinner than both the lid and the security strip which the neck joins; the security strip having an outward surface which is radially outward of the container and of the neck of the security strip and is placed for abutting the edge of the lid if the security strip is attempted to be pivoted outwardly from the container around the neck; the security strip having an inward surface which is radially inward of the neck and which is shaped for contacting the locking bead around the container when it is attempted to raise the lid from the container, which attempts to pivot the security strip outwardly and brings the outward surface of the security strip into abutment against the peripheral edge of the lid for preventing such pivoting of the security strip; the

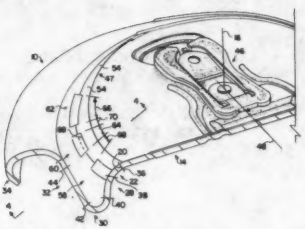


security strip further including an entrance surface which is both downwardly and radially outwardly inclined at the underside of the security strip for engaging the locking bead upon the lid being applied to the container, and such engagement urges both the security strip and the attached lid outwardly temporarily for enabling the security strip to pass the locking bead enabling the lid to be applied to the container.

4,796,772
METAL CLOSURE WITH CIRCUMFERENTIALLY-VARIEGATED STRENGTHENING

Tuan A. Nguyen, Thornton, Colo., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 91,690, Sep. 7, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 183,498
Int. Cl.[4] B65D *8/08*
U.S. Cl. 220—66 **53 Claims**

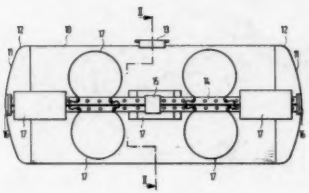


1. A container closure which comprises:
an inner portion having a perimeter;
an outer portion being disposed perimetrically around said inner portion and being spaced outwardly therefrom;
a connecting portion being disposed perimetrically between said inner and outer portions and being integral with both of said portions; and
circumferentially-variegated strengthening means, comprising a selected part of said closure that generally follows the contour of said perimeter, for strengthening said container closure.

4,796,773
TRANSPORT TANK INCLUDING SLOSH GUARD ELEMENTS

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Weitefeld, Fed. Rep. of Germany

PCT No. PCT/DE86/00341, § 371 Date Jun. 23, 1987, § 102(e) Date Jun. 23, 1987, PCT Pub. No. WO87/01101, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 25, 1986, Ser. No. 44,029
Int. Cl.⁴ B65D *1/24*
U.S. Cl. 220—22 **26 Claims**



1. A slosh guard arrangement for transporting liquids and the like of the type including cylindrical wall means closed at both axial ends to form a cylindrical tank, and a manhole extending radially through the cylindrical tank wall means, said man hole having a cross-sectional size substantially smaller than the cylindrical cross-section of the tank, said slosh guard arrangement comprising:

slosh guard elements exhibiting liquid movement dampening surfaces,

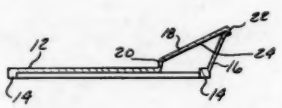
and slosh guard element retaining means for retaining said slosh guard elements in position inside the tank with liquid movement dampening surfaces of said slosh guard elements extending transversely to the longitudinal axis of the tank,

wherein said slosh guard elements and said slosh guard element retaining means are dimensioned and configured to be insertable into the tank and assembled into their operative positions via the manhole without disturbing the remaining structure of the tank.

4,796,774
REMOVABLE AND RESEALABLE LID FOR A CONTAINER

Richard Nabinger, Utica, Mich., assignor to The Answer Company, Warren, Mich.

Filed Jul. 16, 1987, Ser. No. 74,065
Int. Cl.⁴ A47G *19/22*
U.S. Cl. 220—90.4 **2 Claims**



1. A resealable container cover for engagement with a container comprising:

a resilient flat member having a downwardly extending sealing lip, integrally formed on the circumference thereof for sealing engagement with the outer rim of the container top;

a spout forming a generally rectangular opening through said flat member, integrally formed on the top surface of said flat member, having a flat pouring surface extending angularly upwardly from said top surface and beyond the circumference of said flat member, and having a spout sealing ridge, extending outwardly about the circumference of said spout opening;

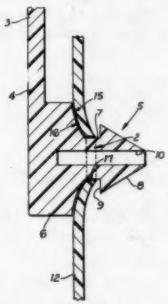
a spout cover, pivotally mounted to the radially inward edge of said spout opening, having a downwardly extending sealing lip, integrally formed on the circumference thereof, for sealing engagement with said spout sealing ridge of said spout when pivoted into a closed position; and

hinge means integrally formed between said spout and said spout cover at said radially inward edge of said spout opening.

4,796,775
CONTAINER WITH HANDLE

Henryk Dudzik, Mansfield, United Kingdom, assignor to Mardon Illingworth Limited, Nottinghamshire, United Kingdom

Filed Nov. 23, 1987, Ser. No. 123,898
Claims priority, application United Kingdom, Nov. 28, 1986, 8628469
Int. Cl.⁴ B65D *25/32*
U.S. Cl. 220—92 **7 Claims**



1. An injection molded plastic container comprising a body having a base and a peripheral wall, said peripheral wall having marginal parts defining a pair of opposite holes passing through said wall and open to the interior of the body; a separately formed bail handle having a projection adjacent each end, the projections extending towards each other and engaging in said holes to mount the handle pivotally on the body, each projection having a cylindrical shank push-fitted in a corresponding hole and directly engaged in said hole, the diameter of each hole in the as-molded state being less than the external diameter of the shank, wherein the marginal parts are inwardly deformed to define a frusto-conical shape, whereby the marginal part of the peripheral wall around the hole is inwardly deformed by the projection and is stressed under compression so as sealingly to grip the shank so that the marginal part is clamped on the shank to form a liquid tight seal.

4,796,776
PRESSURE COOKER FOR MICROWAVE OVENS

H. David Dalquist, Minnetonka; Jorgen A. Jorgensen, Bloomington; Lloyd G. Keleny, Champlin; Donald W. Nygren, and John N. Taylor, both of St. Louis Park, all of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

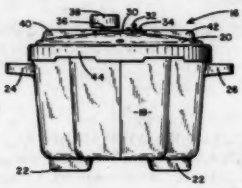
Filed Feb. 19, 1987, Ser. No. 16,632
Int. Cl.⁴ B60L *1/02*; B65D *51/16*
U.S. Cl. 220—203 **17 Claims**

1. A pressure cooker including:

a housing including a container open at its top and a cover adapted for a sealing engagement with said container to close the housing, means forming a valve opening through said cover, and a fastening means for releasably maintaining said container and cover in said sealing engagement

responsive to movement of said cover, relative to said container, to a locking position;

a flexible valve means, mounted with respect to said valve opening, for providing a fluid path between the interior and exterior of said housing, said valve means including a valve portion extended into said interior; and



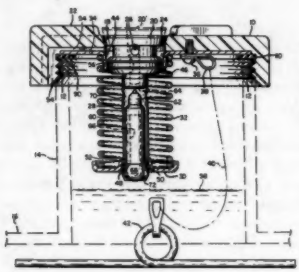
at least one closure projection integral with said container; said valve portion being positioned to contact one of said closure projections as said cover is moved toward said locking position; and, responsive to further movement of said cover toward the locking position, elastically deforming to close said fluid path and permit the maintenance of a positive pressure in said housing interior.

4,796,777

VENTED FUEL TANK CAP AND VALVE ASSEMBLY

Russell D. Keller, 149 N. Lotus Beach Dr., Portland, Oreg. 97217

Filed Dec. 28, 1987, Ser. No. 138,150
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—203 **20 Claims**



1. Vented tank cap apparatus comprising:

cap means for closing a liquid fill opening of a liquid container tank, said cap means including a cap member for covering said fill opening and having a main vent opening therethrough;

valve means for closing said main vent opening, said valve means including a main valve member mounted on said cap member for normally closing said main vent opening in a closed position;

resilient closure means for resiliently urging said main valve member into said closed position but allowing it to open when the pressure within said tank exceeds a predetermined pressure; and

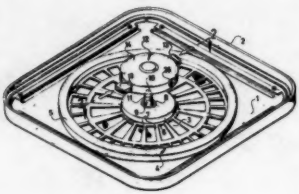
fusible means operatively coupled to the main valve member for closing the main vent opening and for releasing said main valve member and enabling it to move from said closed position to an open position when said fusible means melts.

4,796,778

LOCKING MECHANISM

Klaus Hübig; Wolfgang Taschner, both of Tuttlingen, and Wilfried Wölfle, Bad Dürrheim, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG vormals Jetter & Scheerer, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 176,366
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710049
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—315 **15 Claims**



1. A locking mechanism, in particular, for fixing filter holders on sterilizing containers, comprising:

a housing in which a locking member is displaceable between two end positions, said locking member engaging behind a locking projection in the first end position and releasing it in the second end position,

a spring means which biases said locking member in the direction towards said first end position, and

an actuating member which can be pushed into said housing in order to displace said locking member,

characterized in that:

a second actuating member (**13**; **50**, **51**; **71**, **72**) which can be pushed into said housing is provided,

and in that:

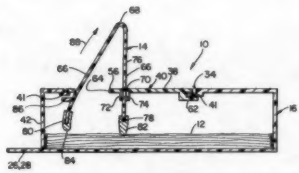
said actuating members (**13**; **50**, **51**; **71**, **72**) protrude from said housing (**14**; **30**; **62**) on opposite sides thereof and are actuatable by displacement in the direction towards the respective other actuating member, said locking mechanism (**12**) only being unlockable if both actuating members are actuated.

4,796,779

COMBINED FILTER HOUSING AND EXTRACTOR

Charles A. Mamolou, 5 Princeton Dr., Bordentown, N.J. 08505

Filed Jan. 11, 1988, Ser. No. 142,010
Int. Cl.[4] B65H *3/00*
U.S. Cl. 221—36 **7 Claims**



1. A combined filter housing and extractor comprising:

(a) filter storage means capable of holding a plurality of conically-shaped filters collapsed into a generally pie-shaped configuration therein, said storage means including;

(i) a hollow generally pie-shaped housing having a top surface provided with a generally pie-shaped opening,

(ii) a bottom surface,

(iii) side walls,

(iv) a small end wall, and

(v) a larger open end through which said plurality of filters may be introduced;

(b) generally pie-shaped cover means for covering said top surface opening, said cover means including;

(i) cover retaining means disposed proximate the larger end thereof for cooperating with said housing means opening releasably retaining said cover means in said housing means opening,

(ii) a major opening and a minor opening, and

(iii) guide means disposed about said minor opening; and

(c) extractor means including;

(i) a V-shaped member having a pair of arms adapted to cooperate with each other by flexing under pressure, one arm of said pair of arms being slidably received into said cover means minor opening for movement perpendicular to said cover means as determined by said guide means, the other arm of said pair of arms being inserted into said cover means major opening, said major opening permitting said other arm to flex and return parallel to said cover and towards and away from said one arm within said cover means major opening, said other arm further comprising an extactor retaining means which cooperates with said housing means opening to releasably retain the cover and extractor when said other arm is in a rest position, and,

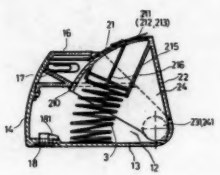
(ii) resilient semi-adhesive material disposed at the distal end of each of said arms.

4,796,780

BOX FOR PINS AND STAPLES

Harrison Huang, Shenkang, Taiwan, assignor to Glory Formosa Co., Ltd., China

Filed Jan. 19, 1988, Ser. No. 145,569
Int. Cl.[4] B65D *83/00*
U.S. Cl. 221—154 **4 Claims**



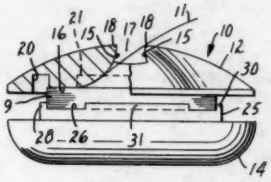
1. A box for pins, staples and the like comprises: an outer case having an opening and an inner box with an upper part projecting out of the top of the outer case; a spring; said outer case having two side plates, one bottom plate and a front plate; said two side plates having round holes disposed at rear lower corners thereof respectively; an inclination plate affixed to an inner side of said front plate, said inclination plate extending backward for a distance; a trigger button extending into the inner portion of the outer case formed in the shape of a hook; said inner box including a front plate with at least one magnetic iron element, a top plate and two side plates; on each of the two side plates of the inner box, a round protruding element enters the round holes on the two side plates of the outer case to serve as a rotating axis of the inner box; the bottom edge of the front plate of the inner box being bent upward to form a hook edge; a cylinder extending downwardly from a bottom edge of the top of the inner box, said spring having its top end inserted in said cylinder and its bottom end being supported against an upper surface of the bottom plate of the outer case, said trigger button for releasably hooking onto the hook edge of the front plate of the inner box.

4,796,781

DISPENSER FOR A STACK OF NOTEPAPER

David C. Windorski, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 23, 1987, Ser. No. 29,172
Int. Cl.[4] B65H *1/00*
U.S. Cl. 221—45 **12 Claims**



1. A dispenser for sheets of notepaper disposed in a stack with each of said sheets having a narrow band of adhesive coated on one surface along one edge by which the sheets are adhered together and with the sheets being stacked with the band of adhesive of adjacent sheets at alternate opposite edges of the tack, said dispenser comprising:

a body part and a base part,

said body part having a top surface, a bottom surface including spaced generally planar portions and convex arcuate portions having a large radius between said planar portions and said top surface defining a narrow slot through and extending centrally across said body,

said base part having a bottom surface and a top surface comprising a generally planar portion,

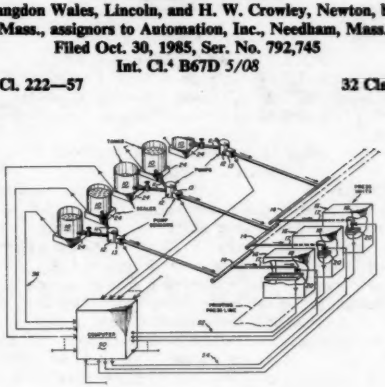
one of said parts including a projecting platform providing one of said planar surface and planar surface portions and the other of said parts having a recess adapted to receive and orient a said stack of sheets and adapted to receive said platform and providing the other one of said planar surface and planar surface portions, the projecting height of said platform being equal to or greater than the depth of the recess so that said planar surface and planar surface portions can engage, said planar surface on said base being adapted to receive and support the bottom of a said stack of sheets and said spaced surface portions being adapted to rest on the top of the stack of sheets.

4,796,782

INK MONITOR SYSTEM

R. Langdon Wales, Lincoln, and H. W. Crowley, Newton, both of Mass., assignors to Automation, Inc., Needham, Mass.

Filed Oct. 30, 1985, Ser. No. 792,745
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—57 **32 Claims**



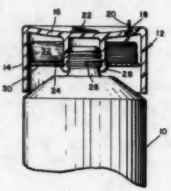
17. A method for monitoring ink flow from an ink storage

tank to at least one ink fountain of a high-speed web-fed printing process comprising the steps of, measuring the weight of the ink storage tank along with any ink stored therein to provide a continuous signal representative of measured weight, pumping the ink to the fountain, comparing the weight signals at successive times to determine the weight of ink consumed over the interval between comparisons, operating delivery to only a single fountain at a time, and measuring the volume flow of ink during a single fountain delivery.

4,796,783
DENTAL FLOSS DISPENSER

Ralph E. Paulson, 14802 Grevillea St., Lawndale, Calif. 90260

Filed Aug. 10, 1987, Ser. No. 84,976
Int. Cl.[4] B65D *25/38*
U.S. Cl. 222—80 **5 Claims**



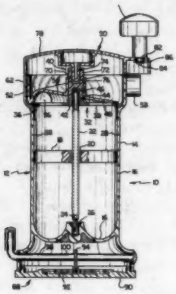
1. A dental floss dispenser comprising:
an external thin walled substantially cylindrical member having a given diameter and covered at on end with a substantially solid face having a single opening,
a smaller diameter internal cylindrical member located within and co-axial with said external member and connected at one end to said solid face and terminating at the other end with a shoulder,
the length of said internal member being less then the length of said external member,
a rotatable hollow disc adapted to be inserted within said external member and having an internal diameter that is greater then the external diameter of said internal member but less then the diameter of said shoulder and an external diameter that is less then the internal diameter of said external member,
said disc located within said external member whereby said shoulder on said internal member holds and supports said disc in a rotatable relationship, and
a coil of dental floss located on said disc within said external member and with one end of said dental floss extending through said opening on said face.

4,796,784
SOFT ICE CREAM DISPENSER

John W. Spirk; John R. Nottingham, both of Moreland Hills, and Jeffrey M. Kalman, Cleveland Heights, all of Ohio, assignors to G & S Metal Product Company, Inc., Cleveland, Ohio

Filed Jul. 2, 1987, Ser. No. 69,099
Int. Cl.[4] B67D *5/00*
U.S. Cl. 222—80 **18 Claims**

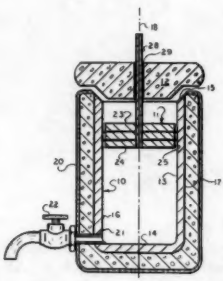
1. An ice cream dispenser comprising a container for receiving ice cream, said container having side wall means, bottom wall means, and removable cover means defining a dispensing spout, said removable cover means including a first closure member having a closure wall defining a volute channel facing said shearing means and being closely spaced therefrom, said volute channel having a progressively increasing cross section measured in a circular direction, with its larger cross section terminating at said dispensing spout, piston means movable along a rectilinear path from a first position adjacent said bottom wall means, along said side wall means, and toward a second position adjacent said cover means, shearing means between said second position and said cover mounted for movement in a plane substantially normal to said path, means to drive said piston means along said rectilinear path, said drive means being operatively connected to said shearing means to move said shearing means in said plane as said piston approaches said second position, whereby ice cream placed in said container may be moved through said shearing means and extruded from said dispensing spout by said piston means upon actuation of said drive means to shear and thereby soften said ice cream.



4,796,785
APPARATUS FOR HOLDING AND DISPENSING BEVERAGES

Timothy K. Merritt, 117 Arbor Park North, Louisville, Ky. 40214

Filed Aug. 17, 1987, Ser. No. 86,938
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—131 **1 Claim**



1. A beverage dispensing apparatus comprising:
(a) a confining vessel comprised of a circular cylindrical sidewall rising perpendicularly upward from a flat circular bottom panel and terminating in an open circular upper extremity, said sidewall and bottom panel being bounded by interior and exterior surfaces, the height of said vessel, measured along its center axis, being at least twice its diameter,
(b) thermal insulation comprised of closed cell polymer foam disposed upon the exterior surfaces of said vessel, and an outer shell of durable impervious material disposed upon said insulation,
(c) a drain conduit which penetrates said thermal insulation means and said sidewall adjacent said bottom panel,
(d) flow control means associated with said conduit exterior to said vessel,
(e) a piston having upper and lower flat surfaces joined by a

circular cylindrical boundary surface disposed in close-fitting sliding engagement with the interior surface of said sidewall, said boundary surface being equipped with at least two O-rings in spaced apart relationship and adapted to make an air-tight seal with the interior surface of the sidewall of the vessel,

(f) a straight stem rising perpendicularly upward from said piston in coaxial alignment with the axis of said vessel, said stem being of hollow construction and adapted to vent off any air trapped below the lower surface of the piston, and

(g) a thermal insulative closure lid having a perimeter adapted to make sealing engagement with the open upper extremity of the vessel, and having a centered aperture adapted to make close-fitting sliding engagement with said stem.

4,796,786

DISPENSER FOR PASTE-LIKE PRODUCTS

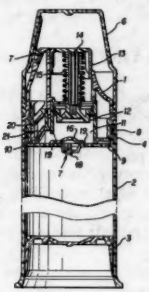
Joachim Czech, Jahnstrabe 19, D-8405 Donaustauf, Fed. Rep. of Germany

Continuation of Ser. No. 738,537, May 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 563,392, Nov. 14, 1983, abandoned. This application Apr. 22, 1987, Ser. No. 47,570

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222492

Int. Cl.[4] B67D *5/40*

U.S. Cl. 222—256 **16 Claims**



1. A dispenser for paste-like products comprising:

a dispensing head which includes a pumping device with a pump chamber, the volume of which chamber may be varied by means of an actuation device manually actuatable form outside the dispensing head, an outlet passage leading from the pump chamber to a dispensing mouth on the dispensing head and means in the outlet passage adapted to prevent backflow of the paste-like material into the pump chamber, a container containing the product to be dispensed, the container being formed as a disposable cartridge and having an upper cover wall with an opening therethrough for admitting the product into the pump chamber, the container having its lower end closed by a follower piston slidable along the interior wall surface thereof under the action of the external atmosphere as the product leaves the container, means for releasably connecting the container to the lower end of the dispensing head, and an inlet-check valve for prevention of backflow of paste-like material form the pump chamber to the container through the opening therein, characterized in that the inlet-check valve comprises two parts, namely, a valve seat on the upper cover wall of the container and a closure member non-releasably supported on the dispensing head, said closure member being integrally formed with the dispensing head and comprising a plate-like portion engageable with the valve seat and flexible connection members connected between the plate-like portion and the dispensing head.

4,796,787

APPARATUS FOR PRECISELY MEASURING AND SUPPLYING LIQUID

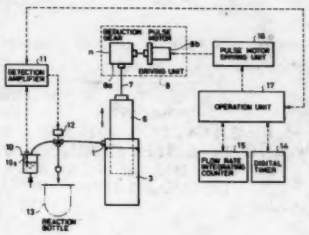
Isao Tsuyaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1986, Ser. No. 914,401

Claims priority, application Japan, Oct. 2, 1985, 219986

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—64 **2 Claims**



1. An apparatus for supplying a liquid, comprising:

a vessel;

a sealing box sealable to an upper side of said vessel and having a liquid discharge port at a lower portion of said sealing box, said vessel being at least partially filled with a liquid at a lower portion of said sealing box;

a cylinder loosely and airtightly pushable downward into said vessel through said sealing box;

a driving unit for driving through a power transmission shaft said cylinder to be pushed into said vessel by a predetermined distance and at a predetermined speed, whereby a correspondingly predetermined amount of said liquid is pushed through said discharge port at a correspondingly predetermined flow rate;

a cross valve coupled to said liquid discharge port;

a receiving vessel coupled to said cross valve;

an air extractor coupled to said cross valve;

a liquid detector in said air extractor; and

a control circuit for coupling said liquid discharge port through said cross valve alternatively to said receiving vessel or to said air extractor in response to a signal from said liquid detector.

4,796,788

BAG-IN-BOX PACKAGING AND DISPENSING OF SUBSTANCES WHICH WILL NOT READILY FLOW BY GRAVITY

Curtis J. Bond, Longboat Key, Fla., assignor to Liqui-Box Corporation, Worthington, Ohio

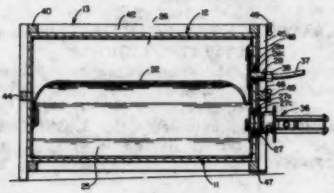
Filed Aug. 26, 1987, Ser. No. 89,653

Int. Cl.[4] B65D *35/22*

U.S. Cl. 222—94 **26 Claims**

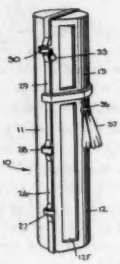
1. A disposable flexible bag for packaging a product which will not readily flow by gravity comprising at least three plies of flexible material sealed together at their peripheral edges, the plies forming an outer product wall, an intermediate product baffle wall, and an outer displacement wall, thereby providing a product-receiving chamber and a pressure-receiving chamber which are independent of each other, and coupling fitments comprising product and pressure fitments connected independently to the respective chambers, said fitments being mounted on one of said outer walls, and a sealing seam between the fitments which seals the outer wall on which they

are disposed to the inner baffle wall so that the product fitment communicates with the product chamber and the pressure



fitment communicates with the pressure chamber independently.

4,796,789
DUAL-FUNCTION GOLF BAG
Reginald Willcocks, 1 Joel Pl., Port Washington, N.Y. 11050
Filed Aug. 2, 1985, Ser. No. 761,788
Int. Cl.[4] A63B *55/00*
U.S. Cl. 224—202 **6 Claims**



1. A golf bag adapted to function as a shoulder carrier for a set of golf clubs and other golf game accessories or as a locked travel case therefor suitable for air transport, said bag having a closed, generally-cylindrical form to store said clubs and comprising:

(A) a semi-cylindrical chest section;

(B) a semi-cylindrical lid section hinged to said chest section, said lid section being divided into a major lid which extends from the closed bottom end of the bag to an upper level below the closed top end, and a minor lid which extends from the upper level of the closed top end, whereby when the minor lid is swung open, the heads of the golf clubs stored in said bag are accessible for removal, the long handles of the clubs resting on the closed bottom end of the bag;

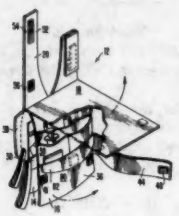
(C) raised edge borders on the major and minor lids which, when the lids are closed, overlie the corresponding edge of the chest section, said edge borders each including a longitudinal course which is parallel to the longitudinal edge of the chest section, the border on the minor lid having at its lower end a circumferential course that overlies a circumferential border course in the upper end of the major lid, whereby the major lid cannot be swung open without first swinging open the minor lid;

(D) releasable latching means on the longitudinal border courses of the major and minor lids adapted to engage complementary anchors on the chest section;

(E) a lock to lock the latching means for the minor lid to its anchor, whereby neither the major nor the minor lid can be swung open without first unlocking the lock and a single lock provides the necessary security against unauthorized access to the contents of the bag, said chest section and said lid section being molded of synthetic plastic material; and

(F) a shoulder strap linked to the exterior of said chest section and a handle attached to said chest section under the strap.

4,796,790
MEDICAL SUPPLY CASE
Olivia B. Hamilton, 5120 Sargent Rd., NE., Apt. 207, Washington, D.C. 20017
Filed Oct. 9, 1986, Ser. No. 917,204
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—253 **52 Claims**



1. A medical supply case for organizing and holding small medical supplies and to be worn or carried by medical personnel comprising:

a first panel having a first panel front side, a first panel rear side, and a first panel side edge,

a second panel connected to said first panel and having a second panel inside side, a second panel outside side, and a second panel side edge,

a hinge means for positioning said first and second panels relative to each other alternatively in a first position wherein said first panel front side is generally facing said second panel inside side and a second position wherein said second panel outside side is generally facing said first panel rear side,

a first securing means for releasably securing said first and second panels in said first position,

a supply pocket on said first panel front side,

a supply pocket on said second panel outside side,

a flap connected generally to said first panel and movable to and between alternative first and second flap positions,

said flap when in said first flap position being disposed between said first and second panels,

said flap when in said second flap position being disposed outside of said second panel outside side,

an attaching means for attaching said first panel to the medical personnel, and

said hinge means being generally vertically disposed when said first panel is worn by the medical personnel by way of said attaching means.

4,796,791
CONSOLE FOR A VEHICLE
Ray J. Goss, 601 TCS, Box 183, Apo, N.Y. 09692-5360, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007
Filed May 8, 1987, Ser. No. 47,280
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—275 **2 Claims**

1. A console adapted for mounting in a vehicle comprising:

(a) a base unit with front and rear corners having a bottom panel, a front panel, a rear panel, two side panels, a top panel, and two inner panels spaced apart and parallel to said front panel and said rear panel to form three chambers

therebetween, wherein said base unit is adapted to sit on the floor and fit between two front seats of a vehicle;

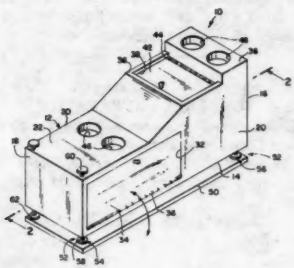
(b) one of said side panels having an opening formed therein to provide access to said chambers to store various items and a pivotal door normally covering said side panel opening and adapted to be pivoted to a lowered position;

(c) said top panel having a stepped portion extending upwardly and rearwardly to said rear panel, said rear panel being higher than said front panel, said stepped portion having an opening formed therein to provide access to said second chamber between said inner panels adapted to hold a removeable trash receptacle and a pivotal lid normally covering said top panel opening and adapted to be pivoted to a raised open position, said top panel further having a first pair of circular recesses formed therein adjacent said front panel to hold drinks and a second pair of circular recesses formed in said stepped portion adjacent said rear panel to hold drinks;

(d) an elongated plate member having front and rear corners adapted to sit upon the floor of a vehicle and support said base unit:

(e) means for leveling said base unit on said plate member with respect to the floor of the vehicle, wherein said leveling means comprises:

(f) a pair of front levelling units, each of said front leveling



units extending vertically through one front corner of said base unit and including an elongated threaded shaft with top and bottom ends having a top knob at said top end and a front level foot at said bottom end, said front level foot having a socket therein and a ball member on each front corner of said plate member to cooperate with said socket in said front level foot so that said top knob can be turned for vertical adjustment of said front leveling units; and

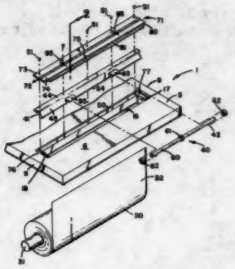
(g) a pair of rear leveling units, each of said rear leveling units extending vertically into one rear corner of said base unit and horizontally through said rear panel and including a long vertical shaft having a top end with a first bevel gear at said top end and an enlarged bottom end with a threaded hole therein, said vertical shaft rotatably mounted to said rear panel of said base unit, a short horizontal shaft having ends and having a second bevel gear cooperating with said first bevel gear at one end and a rear knob at the other end, said horizontal shaft extending through said rear panel, and a rear level foot having a short vertical threaded arm being keyed through said bottom panel and threaded into said enlarged bottom end of said long vertical shaft, said rear level foot further having a socket therein and a ball member on each rear corner of said plate member to cooperate with said socket in said rear level foot so that said rear knob can be turned for vertical adjustment of one of said rear leveling units.

4,796,792

APPARATUS FOR CUTTING WRAPPING PAPER

Robert A. Nelson, Elk River, and Carroll C. Altman, Maple Grove, both of Minn., assignors to Kwik-File, Inc., Golden Valley, Minn.

Filed Jul. 23, 1987, Ser. No. 77,123
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—72 **8 Claims**



1. A paper retainer and cutting assembly for mounting in a countertop feed slot having a sidewall, said assembly comprising:

(a) a retainer mechanism including an elongate rod member and a downwardly extending ramp member;

(i) said ramp member being positionable completely within a countertop feed slot in a manner completely recessed relative to an upper work surface thereof and with said ramp member positioned to extend downwardly toward the feed slot sidewall and partially across the feed slot to a line of termination spaced from the sidewall;

(ii) said elongate rod member being positionable upon said ramp member for being biasing thereby toward the feed slot sidewall;

(b) a knife blade mechanism comprising a hinged arrangement having a first hinge plate and a second hinge plate;

(i) said knife blade mechanism being mountable in the feed slot with the knife blade first and second hinge plates substantially flush with the countertop upper work surface;

(ii) said first hinge plate being a mounting plate and said second hinge plate having an outer edge with a knife blade mounted thereon; said second hinge plate being pivotable between a first horizontal storage position and a second substantially vertical cutting position; and

(iii) said knife blade mechanism including biasing means for urging said second hinge plate into said first horizontal position.

4,796,793

SURGICAL STAPLER AND METHODS

George D. K. Smith; James D. Hughett, both of Cincinnati, and Thomas E. Warman, Williamsburg, all of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed May 10, 1984, Ser. No. 609,091
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] A61B *17/00*
U.S. Cl. 277—19 **28 Claims**

1. A four-bar linkage for operating the staple driver of a surgical stapler and comprising:

a bell crank operatively connected to said driver and pivoted to said stapler at a first pivot;

two drive links pivoted together by a drive pin;

a first one of said links pivoted to said bell crank, and a

second one of said links pivoted to said stapler at a second pivot;

a drive cam means mounted on said stapler for motion with respect to said stapler and for engaging and moving said drive pin to operate said driver;

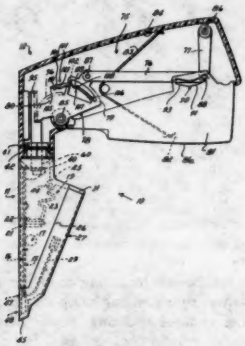
said drive cam presenting an inclined drive surface to said pin during movement of said drive cam.

8. A drive linkage for operating the driver of a surgical stapler having a handle, said linkage comprising:

a trigger lever pivot;

a trigger lever pivoted to said pivot;

a bell crank pivoted to said pivot and having two crank arms;



a drive cam carried on said trigger lever;

two drive links;

a drive pin pivoting the two drive links together at a respective end of each;

one of said drive links pivoted at another end to said handle and the other drive link pivoted at another end to one arm of said bell crank;

another arm of said bell crank operatively connected to said stapler driver; and

said drive cam being engageable with said drive pin to operate said drive linkage and to drive said driver.

4,796,794

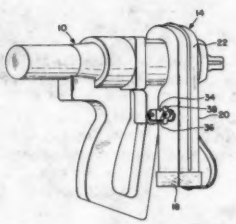
COLLECTION DEVICE FOR A RIVET GUN

Duane M. Schultz, Lansing, Ill., and Gerald J. Wetle, Earl Park, Ind., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Jun. 12, 1987, Ser. No. 61,689

Int. Cl.[4] B21J *15/10*

U.S. Cl. 227—156 **4 Claims**



1. A device for collecting spent mandrels ejected from a rivet gun, comprising a hollow one-piece member including an elongated container portion having an outlet and a chute portion defining a surface generally conforming to the shape of a portion of the external surface of the gun, said chute portion having an inlet configured to be disposed over a spent mandrel ejection port of the gun when mounted to the gun, said chute portion opening into said container portion, a cover removably mounted to said container over said outlet, and means for mounting said one-piece member to the rivet gun.

4,796,795

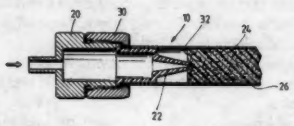
FLUX FUME REMOVAL DEVICE

Paul Urban, Cheraw, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 13, 1987, Ser. No. 107,200

Int. Cl.[4] B23K *3/00*

U.S. Cl. 228—20 **6 Claims**



1. A flux fume removal device comprising:

a housing constructed and arranged for series connection to a vacuum line;

a duckbill valve located within said housing;

means for collecting liquid flux located downstream from said duckbill valve, said means for collecting liquid flux also located within said housing.

4,796,796

SOLDERING APPARATUS

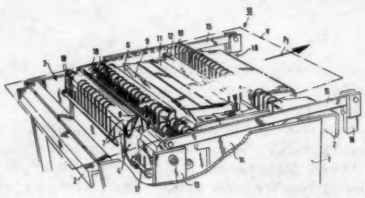
Johannes C. Habraken, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Mar. 31, 1987, Ser. No. 33,142

Claims priority, application Netherlands, Apr. 10, 1986, 8600905

Int. Cl.[4] H05K *3/34;* B23K *1/02*

U.S. Cl. 228—37 **4 Claims**



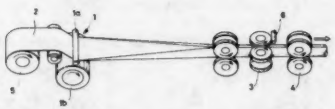
1. A soldering apparatus for soldering components to a printed circuit board, said soldering apparatus comprising a soldering station with at least one nozzle, means for forming at least one soldering wave, a transport device extending above the soldering station for transporting a printed circuit board in a predetermined direction past said at least one soldering wave, said transport device comprising two parallel transport tracks for supporting two opposite edge strips of a printed circuit board, support means and a supporting member affixed to said support means for supporting a printed circuit board, said supporting member being arranged near the soldering station, said supporting member comprising at least one resiliently yielding supporting element, said resiliently yielding supporting element being in the form of an elongate body or bodies having one end secured to said support means, each said elongate body extending from said support means toward said transport device, each said elongate body having a curved free end.

4,796,797

METHOD FOR MAKING THIN-WALLED METAL PIPES

Takefumi Nakako; Shoji Inoue, and Akinobu Takezoe, all of Sakai, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1987, Ser. No. 84,431
Claims priority, application Japan, Oct. 14, 1986, 61-243854
Int. Cl.[4] B23K *31/06*
U.S. Cl. 228—144 9 Claims



1. A method for making thin-walled metal pipes, comprising the steps of:

subjecting a metal sheet to lengthwise plastic bending by means of a small-diameter bending roll with an axis disposed perpendicularly thereto, a face of said metal sheet which is to define the inside of the metal pipe turning inward,

causing said metal sheet to bend itself widthwise into a pipelike shape by use of widthwise curvature resulting from residual stress of the metal sheet after receiving such plastic bending by reducing the lengthwise curvature of the metal sheet to zero, and

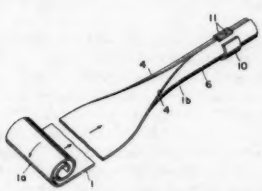
joining longitudinal edges of said metal sheet together.

4,796,798

METHOD OF AND APPARATUS FOR CONTINUOUS PRODUCTION OF SEAM-WELDED METAL TUBING

Toshio Tsuta, Hyogo; Koji Kadota, Kobe; Shigetomo Matsui, Osaka; Hiroyuki Matsumura, Kobe; Hisao Hasegawa, Kobe; Hiromichi Nakamura, Kobe; Tetsuro Noma, Kobe; Hisahiko Miyazaki, Osaka, and Munekatsu Furugen, Nishinomiya, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo and Sumitomo Metal Industries Ltd., Osaka, both of, Japan

Filed Jun. 9, 1987, Ser. No. 60,084
Claims priority, application Japan, Jun. 11, 1986, 61-137087
Int. Cl.[4] B23K *31/06*
U.S. Cl. 228—146 19 Claims



1. A method of continuous production of a seam-welded metal tubing, comprising the steps of:

feeding a metal strip unwound from a strip coil;

shaping the metal strip being fed into a preformed tubing having its longitudinal edges arranged in an opposing and abutting relationship, by means of a series of roll groups arranged substantially in line, said roll groups including a finpass roll group for shaping the strip preparatory to bringing said longitudinal edges into said opposing and abutting relationship;

welding the opposing and abutting longitudinal edges at a position downstream of said finpass roll group while the preformed tubing is being fed forward;

heating in the zone of the finpass roll group, before the welding is carried out, a substantial part of said preformed tubing being fed through the zone of said finpass roll group with exception of edge zones including said longitudinal edges, to a temperature approximately 50° to 200° C. higher than room temperature; and

cooling in the zone of the finpass roll group concurrently with the heating said edge zones of the preformed tubing being fed through said zone of the finpass roll group to keep the edge zones at a temperature of from room temperature to a temperature lower than the room temperature by approximately 50° C.

4. An apparatus for continuous production of a seam-welded metal tubing, comprising:

a series of roll groups arranged substantially in line for shaping a metal strip unwound from a strip coil into a preformed tubing having its longitudinal edges arranged in an opposing and abutting relationship, said roll groups including a finpass roll group for shaping the strip preparatory to bringing said longitudinal edges into said opposing and abutting relationship;

means for welding the opposing and abutting longitudinal edges of the strip at a position downstream of said finpass roll group while said preformed tubing is being carried forward;

heating means arranged in the zone of said finpass roll group for heating a substantial part of said preformed tubing with exception of edge zones including said longitudinal edges of said tubing; and

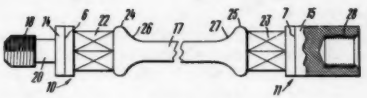
cooling means arranged along said longitudinal edges of the strip which are passing through the zone of the finpass roll group, said cooling means being disposed substantially in parallel to said heating means for cooling said edge zones, when seen transversely to said tubing.

4,796,799

METHOD FOR MAKING SUCKER RODS

Artur T. O. Rasi-Zade; Nariman G. O. Kurbanov; Pavel M. Sutovsky; Talat M. O. Shikhlinsky; Khalid T. Kakhramanov; Avraam M. Rabinovich; Islam K. O. Karaev; Vladimir I. Timofeev, all of Baku, and Oktai I. O. Ibragimov, deceased, late of Baku, all of U.S.S.R. (by Samaya N. K. Ibragimova, administrator), assignors to Azerbaidzhansky Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Neftyanogo Mashinostroenia, Baku, U.S.S.R.

PCT No. PCT/SU85/00094, § 371 Date Jul. 20, 1987, § 102(e) Date Jul. 20, 1987, PCT Pub. No. WO87/03330, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 26, 1985, Ser. No. 96,016
Int. Cl.[4] B23K *20/12, 31/02*
U.S. Cl. 228—155 1 Claim



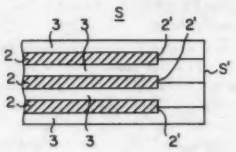
1. A method for making sucker rods composed of a central rod body (16, 17) and end heads (8, 9, 10, 11), incorporating upsetting and pressure-welding procedures, characterized in that first a rod-blank (1) is welded together with rod-end blanks (2, 3), which are made from different materials than the rod-body blank, to obtain a welded sucker-rod blank, whereupon end heads (8, 9, 10, 11) are upset from the welded sucker-rod blank, while the length of the rod-end blanks (2, 3) are so selected that weld joints (6, 7) are established, after the upsetting procedure, across the maximum cross-section of the end heads (8, 9, 10, 11).

4,796,800

STRIP TAPE FOR A FOOD PRODUCT PACKAGING CONTAINER

Motochika Kobinata, Gotenba, Japan, assignor to AB Tetra Pak, Lund, Sweden

Filed Nov. 25, 1987, Ser. No. 125,199
Claims priority, application Japan, Dec. 16, 1986, 61-301211
Int. Cl.[4] B65D *3/10*
U.S. Cl. 229—5.7 4 Claims



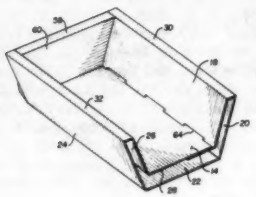
1. A strip tape for a food product packaging container attached to the inner side of a seam of said food product packaging container formed of a paper-based ply material blank so as to improve a barrier feature on the seam area, said tape comprising a plurality of layers which include at least one metal layer, side edges of said metal layer being arranged in a lengthwise direction in the interior of the strip tape so as to not reach the right or left ends of said strip tape arranged in a lengthwise direction.

4,796,801

ARTICLE PACKAGE

Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.

Filed Dec. 16, 1987, Ser. No. 133,545
Int. Cl.[4] B65D *5/00*
U.S. Cl. 229—104 7 Claims



1. A blank adapted to be formed into a container for protecting an article during shipping, storage and display in which at least a part of the article can be seen and touched, said blank comprising:

a planar sheet having a first portion substantially rectangular in shape with a length substantially greater than its width, said first portion having a pair of substantially parallel elongated opposed edges and a free edge at one end, said first portion including a plurality of main panels and a terminal panel opposite the end having said free edge, said terminal panel having an outer edge and an inner edge, each of said main panels being defined by lateral perforations extending between said opposed edges of said first portion,

a single second portion attached to only one of said opposed edges of said first portion and adjacent to only one of said main panels of said first portion, said second portion attached to said one of said opposed edges of said first portion along a perforation, said second portion having a plurality of panels adapted to form an end member of a container when said blank is formed into a container to close one end of a container upon assembly of said blank into a container, and

a series of elongated openings located along said inner edge of said terminal panel of said first portion and a series of tabs extending along said free edge of said first portion, the spacing of said tabs corresponding to the spacing of said elongated openings,

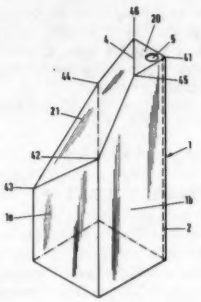
whereby said blank is formed into a container by folding said main panels and said terminal panel along said perforations and inserting said tabs into said elongated openings to hold the container together and folding said panels of said second portion to form the end member to close one end of the container formed from said blank.

4,796,802

FLUID PACK WITH A TAPERED UPPER PORTION

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Park Finance & Trading S.A., Pully, Switzerland

Filed Jun. 25, 1987, Ser. No. 66,829
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621742
Int. Cl.[4] B65D *31/16*
U.S. Cl. 229—108 3 Claims



1. A pack for filling materials which are capable of flow, the pack comprising:

a tube formed by at least one longitudinal sealing seam and having two ends the tube comprising a carrier material coated with thermoplastic material on at least one side thereof;

a top having a pouring opening in the vicinity of its outer edge mounted to one end of the tube;

a bottom mounted to the other end of the tube the bottom being quadrangular and formed from the folded-over tube of the pack in the form of a fold closure;

the top having at least corners and least a first plane and a second plane which include an angle, the first plane being parallel to the plane of the bottom, and the second plane being formed from the tube carrier material.

4,796,803

AIR VOLUME REGULATOR VALVE

Winfield L. Kelley, 1501 Brickell Ave., Miami, Fla. 33129

Continuation-in-part of Ser. No. 880,101, Jun. 30, 1982, Pat. No. 4,739,924, which is a continuation-in-part of Ser. No. 712,762, Mar. 18, 1985, abandoned. This application Oct. 19, 1987, Ser. No. 109,909
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] F24F *11/053*
U.S. Cl. 236—49 4 Claims

1. An air regulating apparatus comprising a valve, said valve comprising

a corrugated fixed sidewall having openings therein;

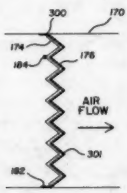
a corrugated slidable sidewall having openings complemen-

tarily mounted on one side of said fixed corrugated sidewall to move in one direction relative to said fixed corrugated sidewall;

said corrugated slidable sidewall being in communication with an air inlet;

said corrugated fixed sidewall being in communication with an air outlet;

said corrugated slidable sidewall being movable in a single direction from a first open position wherein said openings of said corrugated slidable sidewall are aligned with open-



ings of said fixed corrugated sidewall to a closed position wherein the openings of said corrugated slidable sidewall are not aligned with the openings of said fixed corrugated sidewall and to a second open position wherein said openings of said corrugated slidable sidewall are aligned with openings of said fixed corrugated sidewall, means to move said first slidable sidewalls activated by temperature change,

said fixed corrugated sidewall having means fixed thereto upon which said corrugated slidable sidewall is slidably mounted thereon.

4,796,804

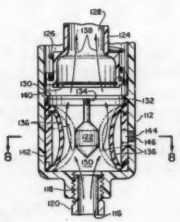
POP-UP SPRINKLER WITH IMPROVED INLET VALVE

Ilan Weiss, 11 Ralph Avenue, Copiague, N.Y. 11726

Filed Aug. 26, 1987, Ser. No. 89,566

Int. Cl.[4] B05B *15/10*

U.S. Cl. 239—1 **3 Claims**



1. A pop-up irrigation sprinkler having a below surface inlet and a diaphragm valve operatively disposed in a vertical orientation in said inlet, said diaphragm valve being of the type having a sealing core and a cylindrical belows in encircling relation thereabout operatively effective to be urged in opposite directions between a clearance position spaced from said sealing core and a contact position therewith for opening and closing said inlet, whereby said bellows movement opening said inlet is not in opposition to the directional flow therethrough and contributes to minimal pressure loss in said flow.

4,796,805

ICE MAKING METHOD USING ICE NUCLEATING MICROORGANISMS

Kristine E. Carlberg, and Carole B. Lindsey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1987, Ser. No. 97,227

Int. Cl.[4] F25C *3/04*

U.S. Cl. 239—2.2 **5 Claims**

1. In a method for making ice using ice nucleating microorganisms comprising the steps of:

(a) forming an aqueous suspension of ice nucleating microorganisms;

(b) introducing said suspension into a water source to form an ice nucleated water source;

(c) distributing and freezing said ice nucleated water source;

the improvement wherein said suspension of ice nucleating microorganisms is maintained throughout steps (a) and (b) at a temperature below about 13° C.

4,796,806

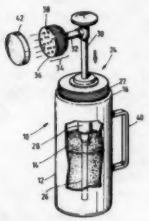
BARBECUE SAUCE SPRAYER

Joyce P. Reid, 1316 W. 115th St., Chicago, Ill. 60643

Filed Mar. 27, 1987, Ser. No. 30,961

Int. Cl.[4] B05B *9/043*

U.S. Cl. 239—11 **5 Claims**



1. A device for spraying barbecue sauce comprising:

a container having a single opening surrounded by a threaded neck;

a plunger pump for pumping barbecue sauce substantially vertically out of said container, said plunger pump being mounted in a lid having a single opening, said lid constructed and arranged to threadably engage said threaded neck;

a tubular fluid connection for receiving the output of said plunger pump;

an externally threaded drum shaped receptacle for receiving the output of said tubular fluid connection;

an internally threaded cap having a plurality of holes to allow for the substantially horizontal passage of barbecue sauce, said internally threaded cap constructed and arranged to threadably engage said drum shaped receptacle.

4,796,807

ULTRASONIC ATOMIZER FOR LIQUIDS

Lothar Bendig, Pfullingen, and Frieder Hofmann, Metzingen, both of Fed. Rep. of Germany, assignors to Lechler GmbH & C. KG, Fellbach, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,136

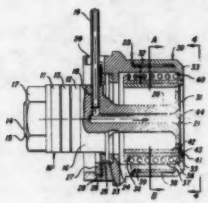
Claims priority, application European Pat. Off., Mar. 17, 1987, 87103907.9

Int. Cl.[4] B05B *3/14*

U.S. Cl. 239—102.2 **12 Claims**

1. An ultrasonic atomizer for liquids, comprising a piezoelectric transducer mechanically coupled to an amplitude transformer; an atomizing disk mounted on a free end of the amplitude transformer; a housing enclosing at least the amplitude transformer; a cap supporting a sieve-like diaphragm and

mounted on the housing so that the diaphragm rests on the atomizing disk; said cap (30) consisting of two parts mounted mutually concentrically, an inner first cap part (32) supporting the diaphragm (31) and an outer, second cap part (33) serving to mount the entire cap (30) on the housing (22); and spring



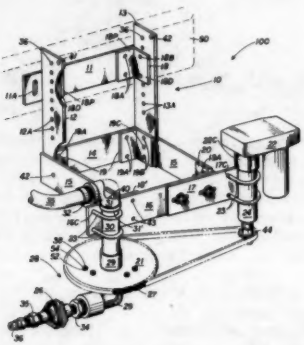
means (36) mounted between the two cap parts (32, 33) and biasing them in mutually opposite axial directions in such a manner that the sieve-like diaphragm (31) is held elastically against the atomizing disk (21) and that the opposing force from the spring means (36) is transmitted to the second cap part (33) fixed to the housing.

4,796,808

TRUCK BUMPER MOUNTABLE WATER SWEEPER

John W. Linda, and Anthony Matracia, both of 7615 Granite Ave., Orangevale, Calif. 95662

Filed Mar. 14, 1988, Ser. No. 177,918
Int. Cl.[4] B05B *9/00*
U.S. Cl. 239—175 **14 Claims**



1. A truck bumper mountable apparatus for sweeping streets with water, which apparatus comprises:

(a) a superstructure,

(b) a bushing assembly,

(c) a motor and drive,

(d) a nozzle assembly, and

(e) linking means operatively connecting said bushing assembly to said nozzle assembly;

said superstructure comprising a pair of spaced vertical struts connected to one another by a pair of spaced normally disposed generally horizontal plates, an upper of which is a mount plate for mounting to a truck bumper and the other of which is a lower plate;

a pair of spaced parallel hinge arms, each of which is pivotally mounted to one of said vertical struts at its proximal end, and each of said hinge arms being connected to the other hinge arm at its distal end, by support means;

said hinge arms being capable of moving from a first upward stowed position to a second lowered operative position;

said bushing assembly having first and second ends, with a motor drive engaging means at its first end and a hub at its second end, said assembly being mounted on said support means;

said motor and drive being a reversible motor and drive mounted on said bushing assembly first end and engaged with bushing assembly;

said nozzle assembly also being mounted on said support means, and having a first end and a second end, with means for connecting a hose from a truck mounted water source at the first end and a sprayhead mounted at the second end thereof,

said sprayhead being disposed at a lower elevation than said hinge arms when said hinge arms are in their lower operative position;

means mounted on said nozzle assembly for rotation of said nozzle assembly with respect to said support means;

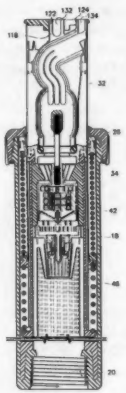
wherein said linking means controls the rotation of said nozzle means upon actuation of said motor.

4,796,809

TWO-STAGE POP-UP SPRINKLER

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Filed May 15, 1987, Ser. No. 49,843
Int. Cl.[4] B05B *3/04, 1/34, 15/10*
U.S. Cl. 239—205 **9 Claims**



8. A multi-stage pop-up sprinkler unit comprising:

a first elongated tubular housing having an axially extending cylindrical bore with inlet means for attachment to a source of pressurized water and outlet means communicating with said bore;

a second elongated tubular housing having an upper end and a lower end reciprocably mounted in said housing for movement between a retracted position within said bore and an extended position extending from the outlet means of said bore;

a nozzle comprising an elongated passage having a curved portion between an inlet thereof and an elongated straight outlet section extending outward at an angle to the axis of the housing, and further comprises means in said curved portion dividing said curved portion into multiple separate passages for inhibiting turbulence in water flowing from said outlet, said curved portion of said passageway extending to one side of the rotary axis of said nozzle and the straight outlet section extending to the other side of the axis;

a tubular protective sleeve reciprocably mounted between said inner and outer housings and moveable with said

inner housing for movement between a retracted position wherein said nozzle is encased therein and an extended position wherein said nozzle is cooperatively extended from said sleeve;

retracting means for biasing said second tubular housing and said sleeve to said retracted position, said retracting means comprises a first compression spring compressed between said first housing and a radial flange of said tubular sleeve for normally biasing said second housing and said sleeve to a retracted position within said first housing;

a second compression spring compressed between said radial flange of said tubular sleeve and a radial flange on said lower end of said second housing for normally biasing said second housing to a retracted position within said first housing; and

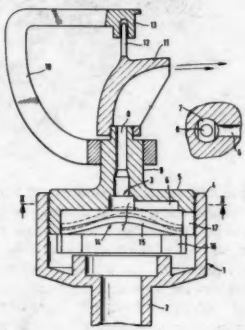
said second housing and said sleeve being responsive to water pressure in said housing for extending said first housing and sleeve from said housing together to a first position wherein said sleeve is restrained from further movement and said second housing extending to a position for exposing the nozzle.

4,796,810

ROTARY IRRIGATION SPRINKLER

Avi Zakai, Rishon Le-Zion, Israel, assignor to Dan Mamtirim, Kibbutz Dan Galil Elyon, Israel

Filed Jul. 24, 1987, Ser. No. 77,209
Claims priority, application Israel, Sep. 18, 1986, 80074
Int. Cl.[4] B05B *3/04, 1/34, 1/30*; A62C *31/02*
U.S. Cl. 239—222.17 **2 Claims**



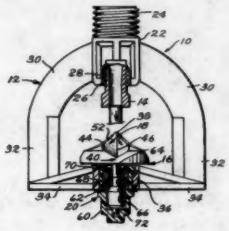
1. In a rotary irrigation mini-sprinkler of the kind comprising a housing having a housing inlet and a housing outlet and, intermediate thereof, a differential pressure control means responsive to variations in the pressure differential between the inlet and outlet and including a throughflow path serving to communicate with said housing inlet and outlet, the through-flow dimensions of said path varying in accordance with said differential, the improvement wherein said housing outlet includes an outflow port in direct communication with said path and having a non-circular transverse cross-sectional shape such as to reduce substantially the velocity of water entering said port from said path and thereby ensuring that the water fully occupies said port.

4,796,811

SPRINKLER HAVING A FLOW RATE COMPENSATING SLOW SPEED ROTARY DISTRIBUTOR

Paul D. Davisson, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Apr. 12, 1988, Ser. No. 180,448
Int. Cl.[4] B05B *3/06*
U.S. Cl. 239—222.17 **22 Claims**



1. A rotary sprinkler head comprising

a sprinkler body having an outlet and means devoid of any operative dynamic seals for communicating a source of water under pressure with said outlet,

said outlet being defined by a nozzle for directing water under pressure communicated therewith into an atmospheric condition in a primary stream having a generally vertically extending axis,

a rotary distributor mounted for rotational movement about a generally vertical rotational axis with respect to said sprinkler body in engaging relation with respect to the primary stream directed from said nozzle,

said rotary distributor having surface means for receiving the primary stream, dividing the primary stream into a plurality of horizontally separated streams, each having a major vertical component of movement and a minor horizontal component of movement, and directing the separated streams while retaining the integrity of the streams in a plurality of generally circumferentially balanced directions outwardly of the vertical axis of the primary stream so that (1) the separated streams leave the distributor surface means with a minor vertical component and a major horizontal component of stream movement and (2) the change in the components of movement of the streams create reactionary forces having net components acting tangentially to the axis of rotation of the distributor which do not increase substantially with increases in flow rates under constant pressure conditions thereby enabling said distributor to operate with a relatively narrow range of rotational speed changes within a relatively wide range of nozzle size changes, and

speed reducing means operatively associated with said distributor for reducing the rotational speed of the distributor resulting from the net tangential components of the reactionary forces from a relatively high whirling speed which would occur without said speed reducing means to a relatively slow speed so related to the distributor surface means forming the pattern forming stream means as to permit said plurality of streams to leave said distributor surface means with sufficient stream integrity to flow outwardly a distance substantially as great as the same streams would flow if the distributor were held stationary.

4,796,812

DEVICE FOR PREPARING AND DISPENSING A PRODUCT CONSISTING OF TWO COMPONENTS AND THE CORRESPONDING PROCESS

Jean-Francois Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Mar. 24, 1987, Ser. No. 29,539

Claims priority, application Luxembourg, Mar. 24, 1986, 86368

Int. Cl.[4] B05B *7/26*

U.S. Cl. 239—303 **14 Claims**

1. A device for preparing and dispensing a product consisting of first and second components which may be mixed only when the product is being dispensed, said first component being fluid and able to constitute a foam, and said second component being solid, comprising:

(a) a pressurized container containing said first component in the form of a liquid;

(b) an outlet valve of said pressurized container through which the first component is to be dispensed;

(c) an operating device for said outlet valve;

(d) means defining an ejection duct from said outlet valve; said ejection duct having a first end nearer said outlet valve and a second end remote from said outlet valve, the second end of said ejection duct delivering the first component in the form of foam;

(e) a chamber having an inlet connected to said second end of said ejection duct and an outlet, said chamber enclosing said second component in particulate form and maintaining it outside the said pressurized container; and

(f) said device consisting of a single grid closing said outlet of said chamber;

said device including a retaining plug separating said second, solid component from said grid.

4,796,813

VISCOUS FLUID SPRAYING APPARATUS HAVING A UNITARY NOZZLE

Lee Marshall, Santa Cruz, Calif., assignor to Slautterback Corporation, Monterey, Calif.

Continuation of Ser. No. 941,859, Dec. 15, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 161,310

Int. Cl.[4] B05B *7/06, 1/14, 1/30*

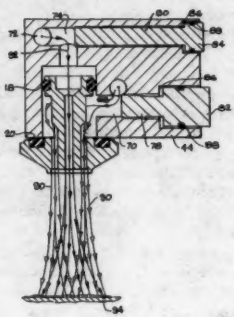
U.S. Cl. 239—425 **17 Claims**

1. A nozzle system for spraying of viscous fluid material comprising:

a nozzle body having an axis, an outlet face at a forward end and two sets of passageways defined at least partially therethrough, including a first set of axially inward gas passageways and including a second set of viscous fluid passageways axially outward and spaced apart from but proximate to the first set of passageways, said fluid passageways disposed partialy coextensive and parallel to the first set of passageways at least closely adjacent said outlet face, said fluid passageways each terminating at the outlet face of the nozzle body, said gas passageways each having an outlet section extending at least to said outlet face,

inert gas supply means in communication with said first set of axially inward gas passageways distal to said outlet face, and

viscous fluid material supply means in communication with said second set of axially outward fluid passageways distal to said outlet face,



whereby volumetric expansion of gas from said gas passageways into the ambient atmosphere at said outlet face breaks up and gives direction to viscous fluid material dispensed from said fluid passageways.

4,796,814

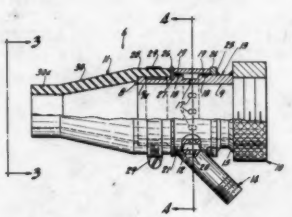
SEMI-LIQUID CEMENTITIOUS SPRAY NOZZLE APPARATUS

Robert E. Klemm, Milwaukee, and Gary D. Lehnhardt, Belgium, both of Wis., assignors to Construction Forms, Inc., Cedarburg, Wis.

Filed Sep. 9, 1987, Ser. No. 94,651

Int. Cl.[4] B05B *7/04, 7/14*

U.S. Cl. 239—430 **20 Claims**



17. A high pressure nozzle for semi-liquid abrasive material, comprising a tubular body having a passageway for transport of abrasive material, an outer air/swivel housing for telescoped in sealing and sliding engagement with said tubular body, sealing means coupled to the housing and tubular body to define an essentially air tight seal between said tubular body and cylindrical housing, air supply means coupled to said cylindrical housing for introducing air between said sealing means, and opening means for transferring of said air into said tubular body for air pressurized movement of said abrasive material.

4,796,815

VARIABLE-SPRAY SHOWER HEAD

Ilan Greenberg, Geula St. 15, Haifa, Israel

Filed Mar. 29, 1988, Ser. No. 174,559

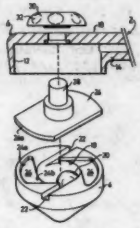
Claims priority, application Israel, Apr. 3, 1987, 82096

Int. Cl.[4] B05B *1/34, 3/04*

U.S. Cl. 239—477 **20 Claims**

1. A variable-spray shower head, comprising: a housing including first and second end walls connected together by an annular side wall and defining an internal chamber therebe-

tween; an inlet through one of said walls for connecting said chamber to a source of pressurized water; a circular cavity formed in said first end wall; a discharge nozzle formed through said first end wall centrally of said circular cavity; means defining a plurality of flow passageways from said inlet



to said circular cavity along different paths with respect to the tangent to said circular cavity; and a manual selector for selectively directing the water to flow from said inlet to said circular cavity via a selected one of said flow passageways to produce a different spray pattern according to the passageway or passageways selected.

4,796,816

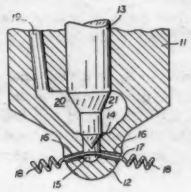
IMPINGING-JET FUEL INJECTION NOZZLE

Gregory Khinchuk, 15 Westbourne Ter., Apt. 3, Brookline, Mass. 02146

Filed Sep. 21, 1987, Ser. No. 98,689

Int. Cl.[4] B05B *15/02, 1/26;* F02M *61/16*

U.S. Cl. 239—501 **4 Claims**



1. A fuel injection nozzle, comprising: a hollow nozzle body having a spray tip with at least one discharge orifice; an axially movable fuel control valve mounted within said nozzle body; a fuel jet disintegrator being attached to said nozzle body and running as an extension of the longitudinal axis of said at least one discharge orifice; said disintegrator comprising a wire which runs through said at least one discharge orifice, whereby the end of said wire extends outside said spray tip and has a shape of a spring with an outer diameter greater than a diameter of said at least one discharge orifice; and when injected fuel exits said at least one discharge orifice, it impinges on the spring-shaped end of the wire, thereby breaking into tiny particles.

3. A fuel injection nozzle comprising:

a hollow nozzle body having a spray tip with at least one discharge orifice; an axially movable fuel control valve mounted within said nozzle body; a fuel jet disintegrator being attached to said nozzle body and running as an extension of the longitudinal axis of said discharge orifice; wherein said at least one discharge orifice has a threaded widened section on its outlet and said disintegrator has a shape of a spring which is screwed into said threaded widened section and leading from said at least one discharge orifice into the combustion chamber; and when injected fuel exits said at least one orifice, it impinges on the portion of the spring leading from said at least one discharge orifice, thereby breaking into tiny particles.

4,796,817

METHOD OF CONTROLLING A BOWL-MILL CRUSHER

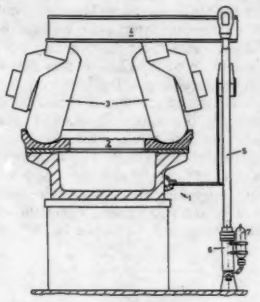
H. Zacher, Am Loh 20, 6349 Greifenstein-Holzhausen, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 105,594

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639206

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—18 **8 Claims**



1. A method of controlling a bowl mill crusher having cylinders remaining in one position and rolling over a rotating bowl with a predetermined force, comprising the steps of supplying raw coal and primary air to the crusher; removing crushed coal from the crusher along with the primary air through a separator; supplying thereafter the crushed coal and primary air to burners through a pulverized-coal line; controlling the pressure of the primary air at entry of the bowl mill crusher according to a first function of load so that pressure of the crushing cylinders against the bowl is decreased according to a second function when a desired load dependent level is not attained. said pressure being increased when said level is exceeded said pressure being dependent on the amount of coal introduced into the mill said pressure being additionally corrected indirectly with respect to the supply of raw coal.

4,796,818

CHIP SLICER IMPROVEMENT

Ed Thoma, W. Vancouver, Canada, assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 30, 1987, Ser. No. 79,841

Int. Cl.[4] B02C *18/14*

U.S. Cl. 241—85 **12 Claims**

1. A mechanism for slicing oversize wood chips into smaller chips, which mechanism includes an enclosing housing; a

cylindrical drum adapted to be rotated about its longitudinal axis within the housing and having a wall including a plurality of segments defining a corresponding plurality of slots in the wall, with the slots extending generally longitudinally along the drum wall, the wall including a plurality of knife elements each being mounted in a wall segment adjacent a slot; means for introducing oversize chips into the drum; an anvil rotor having a plurality of arms each with a corresponding blade element mounted thereon, with the anvil rotor adapted to rotate concentrically within the drum; and means for rotating the anvil rotor and drum in the same direction at different rotational speeds, with the rotor arm speed being greater than the drum speed; whereby oversize chips are positioned and oriented against the drum wall by centrifugal force where they are engaged by the anvil rotor arm blade elements and moved along the wall to the next drum knife element where relative movement of the blade element pushing the chip past the knife element cuts a slice from the chip to pass through a slot for discharge from the mechanism; the improvement comprising:

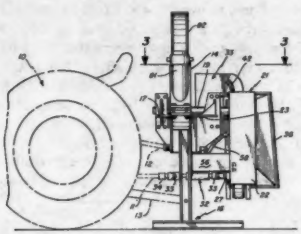
said knife elements and said blade elements being mounted on, respectively, the wall segments and rotor arms angularly relative to each other, passing knife and blade elements thereby defining a region for cutting chips between them less than the length of either, with said region for cutting chips beginning at one end of the passing knife and blade elements and progressing along the axial extent of both to the opposite ends as the blade rotates past the knife.

4,796,819

WOOD CHIPPER TO BE TRANSPORTED AND POWERED BY A TRACTOR

Carl D. Waterman, P.O. Box 349, Waldoboro, Me. 04572

Filed Nov. 16, 1987, Ser. No. 121,078
Int. Cl.[4] B02C *18/06*
U.S. Cl. 241—92 **10 Claims**



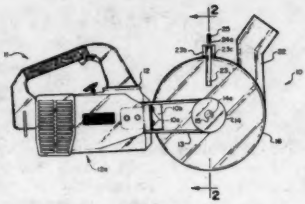
1. A wood chipper adapted to be attached to the rear end of a tractor having a power takeoff shaft and lifting arms and transported by the tractor, said chipper including forward and rearward housings and a stand below the forward housing in support of both housings and to which said arms are connectable, the forward housing being proximate to the tractor when the chipper is connected thereto and provided with a chip discharge, a driven shaft extending through the forward housing and into the rearward housing, bearing units in support of the shaft on opposite sides of the forward housing, a chipping unit within the forward housing and fixed on said driven shaft and provided with chipping blades exposed on the rearward side thereof and with impellers operable to discharge chips through said discharge, a drive shaft connectable to the power takeoff shaft of the tractor extending below the forward housing and rotatably supported by the rearward housing a belt drive within the rearward housing connecting the drive and driven shafts, and a wood feed including a chute opening into the forward housing at an acute angle with respect to the rearward side of the chipping unit with its infeed end close to but lateral of the rearward unit, said wood feed including a pair of feed rollers, means enabling one roller to move towards or away from the other roller, and an hydraulic drive for each roller, said drive including a pump driven by one of said belt connected shafts.

4,796,820

PORTABLE ROCK CRUSHER

Richard W. Hansen, 1027 Crestwood, Meridian, Id. 83642

Filed Aug. 12, 1985, Ser. No. 764,389
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] B02C *13/284, 13/288*
U.S. Cl. 241—69 **12 Claims**



1. A portable pulverizer comprising

a housing including a first housing portion and a second housing portion;

means releasably clamping the second housing portion to the first housing portion; to provide a crushing chamber therein;

a chute opening into the crushing chamber, whereby material crushed is fed into the crushing chamber through the chute;

a shaft journaled through the first housing portion;

a pulley on the shaft outside the crushing chamber;

flail means fixed to and rotatable with the shaft in the crushing chamber;

a chain saw frame and drive means; and

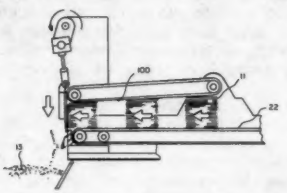
means coupling the drive means of the chain saw to the pulley to drive the shaft and the flail means, whereby operation of the drive means will turn the flail means in the crushing chamber to crush material placed in the housing.

4,796,821

CUTTING APPARATUS FOR LIVING PLANT MATERIALS

Liem T. Pao; Yeong H. Yuen, both of Singapore, Singapore, and Dan T. Wu, Surabaya, Indonesia, assignors to P. T. Panamas, Denpasar-Bali, Indonesia

Filed Jul. 25, 1986, Ser. No. 890,598
Int. Cl.[4] B02C *1/00*
U.S. Cl. 241—101.2 **8 Claims**



1. An apparatus for cutting bundled tobacco leaves, comprising:

cutting means, having a cutting blade coupled to a blade driving means, for cutting bundled tobacco leaves along a cutting plane defined by the cutting blade;

conveying means for conveying the bundled tobacco leaves on a conveying surface to the cutting plane, the bundled tobacco leaves having a thickness perpendicular to the conveying surface less than a preset maximum thickness at the cutting plane;

blade driving means for driving the cutting blade along the cutting plane in a downward stroke and an upwad stroke, the blade cutting bundles within the cutting plane in the downward stroke and the blade withdrawing in the upward stroke above the preset maximum thickness over the conveying surface; and

conveyor driving means, coupled to the conveying means and the blade driving means, for driving the conveying surface so that the conveying surface does not move toward the cutting plane while the cutting blade is less than the preset maximum thickness from the conveying surface and the conveying surface moves a preset distance toward the cutting plane when the cutting blade is more than the preset maximum thickness from the conveying surface wherein the blade driving means includes:

a rotating cam shaft;

means, coupled between the cam shaft and the cutting blade, for translating rotation motion of the cam shaft into reciprocating motion to drive the cutting blade in the upward and downward strokes; and wherein the conveyor driving means includes:

a conveyor cam mounted on the cam shaft of the blade driving means for translating rotation motion of the cam shaft into a reciprocating motion to supply an upward motion and a downward motion synchronized with the upward and downward strokes of the cutting blade;

connecting rod means, having a first end and a second end, connected to the conveyor cam at the first end and having an ajustable stop near the second end, for supplying the reciprocating motion;

a rod joint having a passage receiving the connecting rod means between the first end and the adjustable stop adapted to allow movement of the connecting rod means through the passage unless contacted by the adjustable stop during an upward motion;

a drive cam, coupled to the connecting rod means through the rod joint so that the connecting rod means engages the drive cam when the adjustable stop contacts the rod joint during the upward motion; and

a one way clutch coupled to the drive cam and the conveyor means so that the conveyor surface moves only in the direction of the cutting plane in response to the motion of the drive cam, the position of the adjustable stop on the connecting rod resulting in movement of the conveyor surface while the cutting blade is above the preset maximum thickness and setting the preset distance of the movement.

4,796,822

IMPELLER FOR AN IMPACT CRUSHER

Gabriel M. Terrenzio, Seattle, Wash., assignor to Acrowood Corporation, Everett, Wash.

Continuation of Ser. No. 774,669, Sep. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 553,222, Nov. 18, 1983, Pat. No. 4,577,806. This application Mar. 9, 1987, Ser. No. 23,925

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—275 **14 Claims**

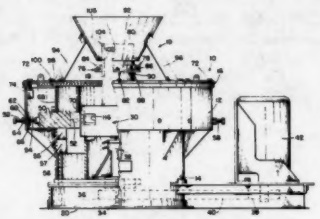
1. An impeller for use in a centrifugal impact rock crusher, said crusher having a cylindrical housing with a vertically disposed central axis and an interior, means defining an impact surface positioned radially around the interior of said housing and transverse to said central axis, impeller mounting means for mounting said impeller concentrically within said housing and for rotating said impeller about said axis, and feed means for feeding rock to be crushed to said impeller, said impeller comprising:

upper and lower cover plates, said lower cover plate being connected to said impeller mounting means and said upper cover plate defining an opening concentric with said axis for receiving rock to be crushed into said impeller;

means defining a landing surface carried upon said lower cover plate concentrically with said axis for impingement thereon of rock being fed to said impeller by said feed means;

a generally cylindrical sidewall between said upper and lower cover plate concentricall with a plurality of exit openings in an equally spaced relationship along said sidewall, each of said openings having two opposite side edges and a top edge and bottom edge between said side edges;

rock retaining means connected to at least one of said cover plates and said sidewall and adjacent to one of said side edges of each of said openings for retaining a portion of rock to be crushed as an accumulation within said impeller in response to rotation thereof, said retaining means being adapted to create and accumulation of such rock at each of said openings, wherein each of said accumulations will include a relatively well-defined accumulation face, rotation of said impeller causing rock to move generally along said accumulation faces as said rock is thrown through said openings; and



a plurality of wear plates carried on said upper and lower cover plates and covering said top and bottom edges of said exit openings, each of said wear plates having a wear plate surface extending outwardly from said landing surface away from said central axis, having an outermost edge, and being connected to one of said cover plates such that one of said accumulation faces will intersect at least one of said wear plates at a respective intersection, each at least one of said wear plates defining a recess along said intersection which extends into said wear plate surface of each of said at least one of said wear plates to a level below the level of the outermost edge of said at least one of said wear plates and away from the location of the respective accumulation face along at least a portion thereof, said recess extending outwardly relative to the landing surface and being adapted to retain therein a portion of rock to be crushed whereby the recess comprises part of the rock retaining means.

4,796,823

SPOOL FOR PROTOGRAPHIC FILM

Mutsuo Akao; Hisao Endo; Toshio Sata, and Masanori Ishiguro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 24, 1987, Ser. No. 88,224

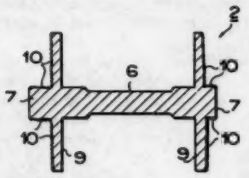
Claims priority, application Japan, Aug. 25, 1986, 61-197085

Int. Cl.[4] B65H *75/18*

U.S. Cl. 242—71.8 **3 Claims**

1. A spool for a photographic film comprising 50 to 99.8 wt. % of polystyrene resin, 0.05 to 2.2 wt. % of at least one member selected from the group consisting of dimethylpolysiloxane and modified dimethylpolysiloxane of which a part of the methyl groups are substituted by carboxylalkyl groups, 0.5 to 6 wt. % of rubber and 0.05 to 3 wt. % of carbon black having

a pH of 5 to 9 and a mean particle size of 10 to 120 m, and the outer surface of the flange of the spool is made rough so that



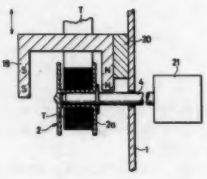
the reflectance of the incident light at an incident angle of 75 degrees is less than 40% in the direction of regular reflection at an angle of 75 degrees.

4,796,824

DEVICE FOR WINDING MAGNETIC TAPE USING MAGNETIC ALIGNMENT

Hiroshi Chikamasa; Akira Takagi, and Masaaki Sakaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1987, Ser. No. 51,785
Claims priority, application Japan, May 20, 1986, 61-113463
Int. Cl.[4] B65H *23/02*
U.S. Cl. 242—76 **5 Claims**



1. A magnetic tape winder, comprising:

a tape winding member to which a magnetic tape is attached;

means for rotating said tape winding member, whereby said magnetic tape is wound on said tape winding member;

at least one, substantially U-shaped magnet for generating a magnetic field extending substantially along the direction of of width of said wound tape, said tape winding member being at least partially disposed between opposing magnetic poles of said magnet, wherein the width l of each of said magnetic poles is greater than the maximum diameter of said wound tape, and wherein the U-shaped magnet is positioned such that at least half the maximum diameter of the wound tape is disposed between opposing magnetic poles of said magnet.

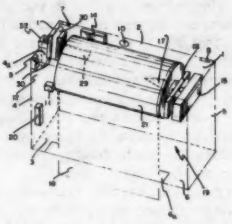
4,796,825

ELECTRONIC PAPER TOWEL DISPENSER

Junior F. Hawkins, 3120 W. 16th, Wichita, Kans. 67203

Continuation-in-part of Ser. No. 877,159, Jun. 23, 1986, abandoned, and Ser. No. 872,041, Jun. 9, 1986, Pat. No. 4,721,265. This application Sep. 25, 1987, Ser. No. 100,904
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] B65H *16/00*; G01V *9/04*
U.S. Cl. 242—55.53 **6 Claims**

1. A paper towel dispenser comprising a cabinet means including a back panel, a top pivotally secured to said back panel, a first side panel secured to said back panel, a second side panel having a side opening and secured to said back panel, a front panel secured to said first and second side panels, and a bottom panel having a bottom opening and secured to said first and second side panels and to said front and back panels, a motor means secured to said back panel for producing rotational energy; a control circuit means mounted in said cabinet means and comprising a touchless switch means for energizing and de-energizing said motor means and dispensing paper towels in a sanitary manner; cone-shaped bearing means coupled to said motor means and frictionally, rotationally engages one side of paper towels for dispensing same when said motor means is energized; a stop member mounted to said back panel; a second bearing means releasably engaging an-



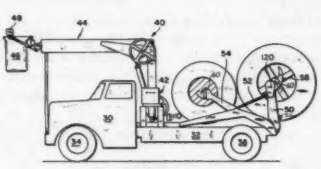
other side of the paper towels and supporting the same while being rotationally dispensed when the cone-shaped bearing means is rotated by the motor means; a bracket assembly integrally bound to said second bearing means and superimposed over the stop member and slidably mounted along the back panel in proximity to said side opening; and a means secured to said stop member and to said bracket assembly for biasing said bracket assembly away from said stop member and for biasing said second bearing means towards said paper towels.

4,796,826

METHOD OF STRINGING CABLE FROM A SPOOL MOUNTED ON A WHEELED VEHICLE AND A SYSTEM FOR PERFORMING THE METHOD

Wayne M. Pierce, 393 West River Rd., Milford, Conn. 06477

Division of Ser. No. 707,646, Mar. 4, 1985, Pat. No. 4,643,370. This application Jan. 6, 1987, Ser. No. 845
Int. Cl.[4] B65H *75/42*
U.S. Cl. 242—86.5 R **11 Claims**



1. An apparatus for loading a spool onto a vehicle, the spool provided with a rod substantially axially extending therethrough and beyond the longitudinal ends thereof, one longitudinal end of the rod being provided with a drive sprocket concurrently rotatable with the rod, said apparatus comprising:

a pair of spaced rear arms pivotable about a first common axis, each rear arm provided with at least one finger protruding from an end thereof, the region between the rear arm and its associated finger being recessed and adapted to receive an end of the rod;

means associated with one of said rear arms adapted for operable engagement with and for rotating the drive sprocket when the drive sprocket is disposed in a predetermined position relative to said one rear arm;

means for disposing the drive sprocket in said predetermined position relative to said one rear arm;

a pair of spaced forward arms pivotable about a second

common axis substantially parallel with said first axis, each forward arm provided with at least one finger protruding from an end thereof, the region between the forward arm and its associated finger being recessed and adapted to receive an end of the rod;

means associated with one of said forward arms adapted for operable engagement with and for rotating the drive sprocket when the drive sprocket is disposed in a predetermined position relative to said one forward arm;

means for disposing the drive sprocket in said predetermined position relative to said one forward arm;

means for pivoting the pair of rear arms such that the fingers of the rear arms move between a first, lower position and a second, higher position; and

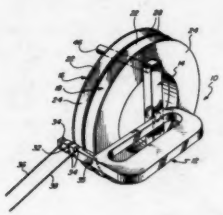
means for pivoting the pair of forward arms such that the fingers of the forward arms move between a third position and a fourth position, said second position and said fourth position being in substantially the same region of space, whereby the rod may be transferred from the recesses of said rear arms to the recesses of said forward arms.

4,796,827

COMBINATION KITE CONTROL AND REEL DEVICE

Dean J. Munt, III, and Nancy J. Munt, both of 27665 Estepona, Mission Viejo, Calif. 92630

Filed Aug. 26, 1987, Ser. No. 89,560
Int. Cl.[4] B65H *75/40*; B64C *31/06*
U.S. Cl. 242—96 **10 Claims**



1. A dual-line, hand-held, kite-control device, comprising:

a handle means including an axle pin integrally formed therewith;

a drive spindle rotatably mounted to said axle pin;

said drive spindle including means for rotating said drive spindle about said axle pin;

a pair of line spools removably mountable to said drive spindle whereby said line spools are hand-held in each hand of an operator thereof when said line spools are removed from said drive spindle;

means for removably mounting said line spools to said drive spindle; and

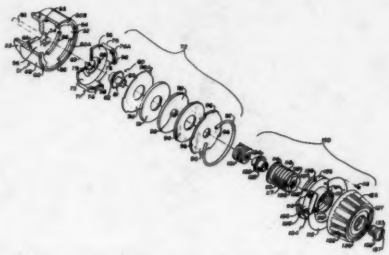
guide means formed on said handle means whereby lines from said line spools mounted on said drive spindle are guided back onto said line spools as said drive spindle is rotated.

4,796,828

CARTRIDGE REAR MOUNTED DRAG ASSEMBLY AND METHOD

Richard R. Councilman, Collinsville, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Continuation of Ser. No. 794,965, Nov. 5, 1985, abandoned, which is a continuation of Ser. No. 670,657, Nov. 9, 1984, abandoned, which is a continuation of Ser. No. 470,604, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 406,539, Aug. 9, 1982, Pat. No. 4,488,689. This application Jan. 28, 1987, Ser. No. 9,648
Int. Cl.[4] A01K *89/00*
U.S. Cl. 242—84.5 A **22 Claims**



1. In an open faced spinning reel used for casting and retrieving a fishing line, the reel having a housing and a centershaft, the centershaft being axially reciprocable and having a keyed portion extending into a rearwardly facing cavity on the reel housing, a spool carried by a forward portion of the centershaft, a handcrank, a rotatably mounted bail support member connected by a transmission means to the handcrank to be rotated thereby; and bail means pivotally mounted on the support member to be rotated therewith; the improvement comprising

drag adjusting means for changing the drag on the centershaft and on the spool, the drag adjusting means comprising:

(A) drag applying cartridge means seated in the rearward facing cavity of the housing and being keyed to the reel housing to prevent rotation of the cartridge means relative to the cavity and to the reel housing; the cartridge means including

(a) drag drive means in the cartridge means keyed to the keyed portion of the centershaft;

(b) driven means in the cartridge means keyed to the drag drive means;

(c) a non-rotatable, axially movably means in the cartridge means which is axially spaced by friction means from the driven means; and

(d) means for retaining the drag drive means, driven means and non-rotatable means together whereby the cartridge means includes the drag drive means removable keyed to the centershaft, driven means keyed to the drag drive means, and friction means between the driven means and the non-rotatable means;

(B) spring means external of the cartridge means and bearing against the non-rotatable, axially movable means;

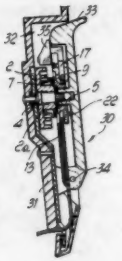
(C) adjusting means carried by the reel housing and bearing against the spring means; knob means turning the adjusting means for increasing or decreasing the loading of the spring means against the non-rotatable portion of the cartridge means to increase or decrease the drag on the centershaft and spool; gear means carried by the drag drive member and clicker means carried by the cartridge means extending into contact with the gear means whereby rotation of the centershaft produces an audible clicking sound.

4,796,829

WINDER SAFETY DEVICE, PARTICULARLY FOR SKI BOOTS

Alessandro Pozzobon, Paderno Di Ponzano Veneto, and Pietro Manfré, Vedelago, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Oct. 7, 1987, Ser. No. 105,623
Claims priority, application Italy, Oct. 20, 1986, 82584 A/86
Int. Cl.[4] B65H 75/38; A43B 11/00, 5/04
U.S. Cl. 242—100 5 Claims



1. A winder safety device, particularly for ski boots, comprising:

a supporting element defined by a ski boot

an operating knob

a stem defined by said knob

axial means for linking said stem to said supporting means so as to permit both a loose rotatory movement and a limited axial movement between said stem and said supporting means

a drive wheel

faceted means for connecting in rigid rotatory relationship said drive wheel to said stem while allowing for an axial movement between said drive wheel and said stem

a first gear provided on said drive wheel

a winder

a flexible traction element having a portion thereof secured to said winder so as to be able to be wound on said winder

said winder being pivotally mounted on said supporting element and being arranged for coaxial rotation with respect to said stem, in a direction of winding and in a direction of unwinding of said flexible traction element, a second gear defined by said winder, said second gear being arranged in facing relationship with said first gear for substantially continuous engagement therewith, said first gear and said second gear being so shaped that, upon driving of said first gear in said winding direction, said first gear is caused to mesh unidirectionally with said second gear to permit transmission of drive between said knob and said winder in said winding direction and, upon driving of said first gear in said unwinding direction, said first gear is automatically caused to engage without meshing with said second gear to prevent transmission of drive from said knob to said winder in said unwinding direction, whereby insuring safe unidirectional winding of said traction element.

4,796,830

CABLE REEL

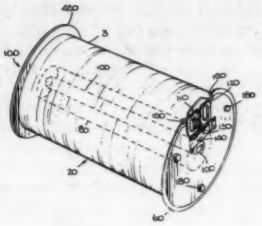
Stanley Gelfman, 491 High Cliffe La., Tarrytown, N.Y. 10591

Filed Mar. 25, 1988, Ser. No. 173,288
Int. Cl.[4] B65H 75/12
U.S. Cl. 242—117 21 Claims

1. A cable reel comprising:

a first cylindrical member about which cable can be wound having a longitudinal axis and a hollow interior;

first and second flanges disposed at opposite ends of said cylindrical member substantially at right angles to the longitudinal axis of said cylindrical member, one of said flanges having an outside surface having at least one opening arranged adjacent the periphery of said one flange through which the cable can be traversed and a second opening in the surface disposed adjacent the center of said one flange and opening into the hollow interior of the cylindrical member, said hollow interior adapted to receive ends of the cable wound on said cylindrical member through the second opening, and further comprising means attached to said one flange having a wall disposed adjacent and parallel to the outside surface of said one flange and at a spacing from the surface of said one flange equal to at least approximately the thickness of said cable, for receiving the cable between the surface and the wall, thereby protecting said cable extending between said first and second openings.

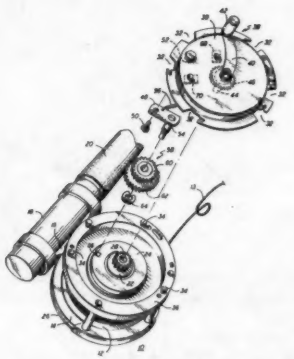


4,796,831

MULTIPLIER FLY CASTING REEL WITH ANTI-REVERSING MECHANISM

William G. Sheppard, Ilion, N.Y., assignor to Martin Automatic Fishing Reel Co., Inc., Mohawk, N.Y.

Filed Oct. 16, 1987, Ser. No. 109,076
Int. Cl.[4] A01K 89/00
U.S. Cl. 242—212 11 Claims



1. A multiplier fly casting reel comprising a spool for containing a length of fly fishing line; a frame rotatably mounting said spool; a cover mounted on said frame axially over one side of the spool; a manually rotatable crank journalled in said cover and having a crank gear affixed thereon; an axial drive pinion mounted at one side of said spool; a multiplier gear assembly disposed between the spool and the cover and engaging the spool drive pinion and the crank gear such that a single rotation of said crank results in more than one rotation of the

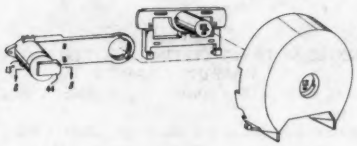
spool; and means for mounting said multiplier gear assembly to permit limited movement thereof with respect to said crank gear and spool drive pinion including means for moving the multiplier gear assembly in response to spool rotation when said fly line is drawn out from said spool to disengage the crank from the spool so that the crank is not turned by the rotation of said spool, and means for automatically moving back the multiplier gear assembly for reengaging the crank with the spool to permit rewind of said line when drawing out of the line ceases.

4,796,832

DISPENSER FOR JUMBO ROLL OF TOILET TISSUE

Rudolph W. Schutz, Walnut Creek, and William Schultz, Pacifica, both of Calif., assignors to James River II, Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 20,635, Mar. 2, 1987, abandoned. This application Nov. 16, 1987, Ser. No. 121,310
Int. Cl.[4] B65H *19/10, 35/06*
U.S. Cl. 242—55.3 **5 Claims**



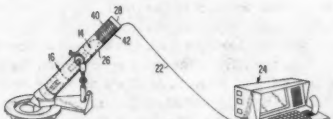
1. A dispenser for roll tissue comprising a base adapted to be secured to a wall, a first spindle extending from the base for receiving a jumbo roll of tissue, a second spindle mounted on the base for receiving the jumbo roll after it has been partially spent, a housing adapted to enclose the first spindle but not the second spindle, the housing being hinged to the base to permit access to the first spindle, means securing the housing and the second spindle that discourage pilferage of the rolls but permit access to them by an attendant when the rolls are changed, the means for securing the second spindle being a movable retaining element capable of extending from the end of the spindle in a direction substantially perpendicular to the axis of the spindle to discourage pilferage of a stub roll borne by the spindle, and being capable of being moved so that it does not so extend from the spindle to permit the stub roll to be removed and replaced.

4,796,833

OPTICAL FIBER GUIDED TUBE-LAUNCHED PROJECTILE SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 032,448, Mar. 31, 1987. This application Sep. 8, 1987, Ser. No. 93,599
Int. Cl.[4] F41G *7/32*
U.S. Cl. 244—3.12 **7 Claims**



1. In an optical fiber guided projectile system for firing a projectile having trailing and leading ends from a generally tubular launcher and for guiding the projectile to a target, wherein the projectile includes an extended length of optical fiber disposed for streaming from the trailing end of the projectile during flight and wherein, prior to firing, a portion of the optical fiber extends from the trailing end of the projectile axially along the inner surface of the tubular launcher and through the mouth of the launcher to a control means, the improvement comprising:

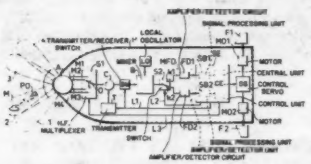
a generally resilient plug disposed in the launcher between the leading end of the projectile and the mouth of the launcher, said plug securing said portion of the optical fiber in axial orientation along the inner surface of the tubular launcher during firing of said projectile.

4,796,834

METHOD FOR COMBATTING OF TARGETS AND PROJECTILE OR MISSILE FOR CARRYING OUT THE METHOD

Lars G. W. Ahlström, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 298,129, Aug. 31, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,215
Claims priority, application Sweden, Sep. 15, 1980, 8006457
Int. Cl.[4] F41G *7/22*
U.S. Cl. 244—3.16 **2 Claims**



1. A weapon system for guiding projectiles to a target at which they are fired, said projectiles including:

(a) at least one target illuminating projectile having illuminating means for directively transmitting illuminating electromagnetic radiation towards the target only during a latter part of a continuing path of travel of said illuminating projectile toward said target; and

(b) at least one self-guided projectile having a target tracking device comprising:

(1) receiving and detecting means adapted for receiving and detecting illuminating electromagnetic radiation transmitted by a target illuminating projectile and reflected from the target;

(2) signal processing means coupled to the receiving and detecting means for producing an error signal representing deviation of the self-guided projectile's path of travel from the target; and

(3) guiding means coupled to the signal processing means and responsive to said error signal to adjust the path of travel of the self-guided projectile to reduce said deviation;

said illuminating means comprising a multilobe antenna and means coupled to said antenna and to said signal processing means for selectively activating a lobe of said antenna in which the target is detected.

4,796,835

PROJECTILE

Mark W. Galvin, Simi Valley, Calif., assignor to The Marquardt Company, Van Nuys, Calif.

Continuation-in-part of Ser. No. 942,724, Dec. 17, 1986, Pat. No. 4,752,052. This application Aug. 24, 1987, Ser. No. 88,650
Int. Cl.[4] F42B *13/32*
U.S. Cl. 244—3.29 **18 Claims**

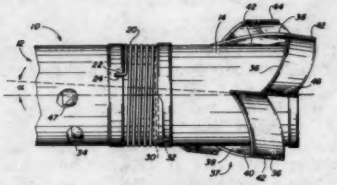
1. An improved spin and flight-stabilized projectile, said projectile comprising in combination:

(a) an elongated projectile body;

(b) an outer shell disposed around a portion of said body;

(c) a plurality of fins connected to and forming part of said shell for simultaneous movement of said fins between a closed low-profile position overlying the outer periphery

of said body and a fully deployed flight-stabilizing position projecting outwardly from said body, each said fin comprising a pair of elongated plates separately hinged on the opposite ends thereof, one end of each plate being hinged to the other of said pair of plates and the opposite ends of said pair of plates being hinged to said shell, said



pairs of plates being aligned in a direction diagonal to the longitudinal axis of said body, with said hinges at an angle to said longitudinal axis; to provide said projectile during flight with a rolling moment around said longitudinal axis,

(d) impeller means operatively connected to said shell for moving said fins between said stored and deployed positions.

4,796,836

LIFTING ENGINE FOR VTOL AIRCRAFTS

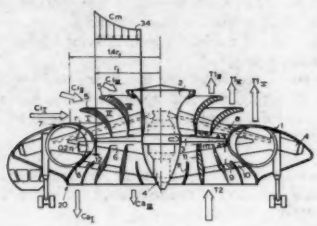
Benno Buchelt, Maria Saal, Austria, assignor to Dieter Schatzmayr, Klagenfurt, Austria

Continuation-in-part of Ser. No. 834,799, Feb. 28, 1986, abandoned. This application Feb. 3, 1987, Ser. No. 10,360

Claims priority, application Austria, Feb. 28, 1985, 600/85

Int. Cl.[4] B64C *29/00*

U.S. Cl. 244—23 R **15 Claims**



1. A propulsion apparatus for generating vertical lift in an aircraft, comprising:

a fan shroud defining a substantially vertical airflow passage having an axis, an upper inlet end and a lower outlet end, said passage being rotationally symmetrical about said axis but differing from a right-circular cylinder over its entire length;

a fan rotatable in said passage about said axis and having a plurality of generally radial blades where the radial axis of these blades is lying in a plane perpendicular to said axis between said inlet and outlet ends and where these fan blades can be also rotatable around their blade axis for control purposes;

a torus-like convexly curved part rotationally symmetrical about said axis and formed on said shroud at said inlet end of said passage, said torus-like convexly curved part extending from a location substantially 1.4 r_f upstream of said blades seen radially to a location substantially 0.2 r_f downstream of said blades seen axially where r_f is a tip radius of said blades measured from said axis to a tip of the blades, said tips of said blades defining a gap with said part which is at most 1/25 of the diameter of said fan; and

at least one engine operatively connected with said fan for rotating same,

said rotating blades being of airfoil cross section with the angle between the chord lines of the blades and the rotation plane of the fan blades decreasing from the hub of the fan to a radial midsection of the fan blades and increasing from the radial midsection towards the fan tip by an increment (AB) having a value in the range from 0 degrees up to 25 degrees to generate upon rotation of said fan a meridional airflow velocity through said passage which is nonuniform over the radius thereof and increases from a value proximal to said axis to a maximum at the periphery of said passage, said radial midsection of the fan blades being defined as a distance $\pm 0.25 r_f$ around a means fan blade radius and as the arithmetic means between fan hub radius and fan tip radius, and

the meridional radii of curvature of said torus-like convexly curved part between said locations being $0.2 r_f$ to $1 r_f$.

4,796,837

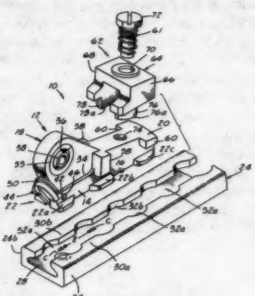
LEG SEAT TRACK FITTING WITH IMPROVED BEARING MEMBER

Eugene G. Dowd, 4711 Clubview Dr., Westlake Village, Calif. 91362

Continuation-in-part of Ser. No. 78,202, Jul. 27, 1987. This application Apr. 15, 1988, Ser. No. 182,103

Int. Cl.[4] B64D *11/06*

U.S. Cl. 244—122 R **10 Claims**



5. A leg seat track fitting adapted to be removably secured in a track carrying an airplane seat wherein said track has an elongated groove disposed lengthwise in the track which is partially covered by a pair of spaced apart lips which are parallel to each other and provide a gap there between and have therein a series of aligned pairs of slots which provide a series of receptacle sections in the track,

said track fitting comprising

a body member having a base and a wall element extending outwardly from the base, an enlarged leg holding section integral with the wall element and including a spherical bearing member for receiving pin means which is attached to the leg of the airplane seat, said spherical bearing member being received within an opening in the wall element and comprising

(a) a tubular member having opposed open ends connected by a passageway which receives the pin means, said tubular member having a raised, external portion intermediate said ends which has a segmented, convex spherical bearing surface, and

(b) a pair of retainer elements having internal, segmented, concave, spherical surfaces which conform to the spherical bearing surface, each retainer element being on opposite sides of the raised external portion

of the tubular member and press fitted in the opening in the wall element to hold the tubular member in position,

said base being generally flat and adapted to abut the floor of the track when the fitting is placed in the track, with the wall extending outwardly through the gap between the lips,

integral with the body member, a plurality of spaced apart pairs of tabs, with the tabs of each pair being on opposite sides of the wall and projecting outwardly from the wall generally at a right angle to the wall, with the distance between said pairs of tabs being equal to the distance between adjacent pairs of receptacle sections, and

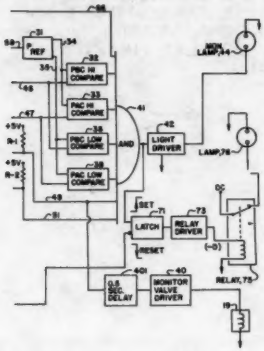
said tabs being adapted to grip the underside of the lips between adjacent pairs of receptacles when aligned therewith and the fitting received in the groove, said tabs also being adapted to be received in the groove by passing through corresponding receptacles and laterally moving the fitting in the groove to bring the tabs into registration with the underside of the lips between adjacent pairs of slots.

4,796,838

HOSE REEL MONITOR FOR INFLIGHT REFUELING SYSTEM

Tsutomu Yamamoto, Fountain Valley, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1988, Ser. No. 144,885
Int. Cl.[4] B64D *39/02*
U.S. Cl. 244—135 A **1 Claim**



1. Aircraft inflight fuel transfer hose reel monitor system having a boost cylinder and an accumulator, comprising:

a first signal source for producing a first signal proportional to actual hydraulic pressure within said boost cylinder;

a second signal source for producing a second signal proportional to actual hydraulic pressure within said accumulator;

first, second, third and fourth comparator means each having first and second input terminals and an output terminal;

reference signal generator means for applying an upper limit reference signal derived from an airspeed related computed reference voltage to the first input terminal of said first and second comparator, and for applying a lower limit reference signal, derived from said computed reference voltage to the first input terminal of said third and fourth comparator;

a first test signal source for producing a first simulated test signal representing a normal value of hydraulic pressure within said boost cylinder;

a second test signal source for producing a second simulated test signal representing a normal value of hydraulic pressure within said accumulator;

indicator means coupled to the output terminals of said first, second, third and fourth comparators for producing an output indication only if signals applied to the second input terminals of all of said comparators have values lying between said lower limit and said upper limit; and

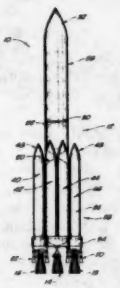
switching means for coupling said first and second simulated test signals to the second input terminals of said comparators during a self test interval, and for thereafter coupling said first and second actual hydraulic pressure signals to the second input terminals of said comparators after deployment of said hose.

4,796,839

SPACE LAUNCH VEHICLE

Hubert P. Davis, Star Rte. 2, Box 298K, Canyon Lake, Tex. 78130

Filed Jan. 8, 1987, Ser. No. 1,804
Int. Cl.[4] B64G *1/40, 1/62*
U.S. Cl. 244—158 R **3 Claims**



1.

A method of launching a rocket vehicle having one fixedly mounted rocket engine and two detachable mounted rocket engines affixed to a structural base member, having a plurality of propellant tanks demountably fastened to the exterior of said rocket vehicle forward of said structural base member, having fuel tanks fixed to the interior of said rocket vehicle, and having a payload fairing in the forward portion of said rocket vehicle, said method of launching comprising the steps of:

igniting said fixedly mounted rocket engine and said detachably mounted rocket engines;

passing propellant to said engines from said plurality of propellant tanks until said rocket vehicle achieves a desired altitude;

stopping the passage of propellant between said propellant tanks and said two detachably mounted rocket engines such that said detachably mounted rocket engines are shut down;

detaching first each of said detachably mounted rocket engines from said rocket vehicle such that each of said detachably mounted rocket engines drop from said rocket vehicle, said step of detaching further comprising:

securing the detached rocket engines within a reentry vehicle, said reentry vehicle being a structural member having atmospheric shielding capabilities for protection of said rocket engine, said reentry vehicle having a parachute deployment section arranged therein;

demounting second said plurality of propellant tanks from the exterior of said rocket vehicle such that said plural-

ity of propellant tanks drop from said rocket vehicle; and

passing propellant from said fuel tanks to said fixedly mounted rocket engine, said propellant from said fuel tanks sufficient to allow said rocket vehicle to achieve an orbit.

4,796,840

TRAILING EDGE FLAP OPERATION IN WINGS

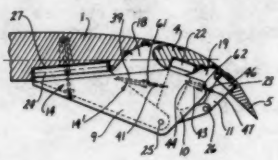
Johann T. Heynatz, Immenstaad, Fed. Rep. of Germany, assignor to Dornier GmbH, Fridrichshafen, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,307

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624675

Int. Cl.[4] B64C *9/18*

U.S. Cl. 244—215 **7 Claims**



1. Flap arrangement with adjustment devices along the trailing edge of an aircraft wing, having a plurality of wing flaps, comprising:

a first flap carrier, pivotably mounted to the wing, on shaft means which extend in chord direction of the wing, said shaft means being slidably mounted in a recess on the underside of the wing, for sliding in spanwise direction, said first carrier thus being provided for pivoting and down extension as well as sliding, in and retraction into the recess in the wing, while undergoing a combined sliding and pivot motion for down extension, the carrier will extend in spanwise direction when folded into the recess;

a plurality of further carriers including a second carrier being hinged to said first carrier through a first, spanwise pivot axis when the first carrier is pivoted out of the recess, and a third carrier pivoted to the second carrier by a second pivot axis extending spanwise when the second and third carrier extend down, the plurality of further carriers being respectively pivoted to further chordwise axes on said wing flaps such that when all said wing flaps are in a retracted position the latter chordwise pivot axes are coaxial with said first pivot axis;

means for pivoting the further carriers about the spanwise pivot axes for protraction and retraction of the wing flaps;

said wing flaps having recesses, said further chordwise axes being established by additional shafts, respectively, sliding in the latter recesses; and

the first carrier, when situated in the recess of the wing, causing the wing to offer minimal drag as all of the carriers are now within aerodynamic confines of the wing plus wing flap configuration.

4,796,841

FABRIC REINFORCED RUBBER PRODUCT HAVING MOLDED ISOLATOR BUSHINGS

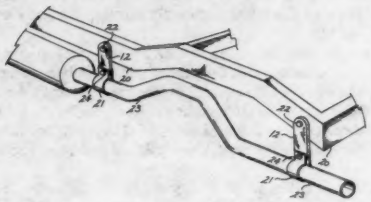
Louis Baker, Mishawaka, Ind., and Gerald W. Holland, Matthews, N.C., assignors to Baker Rubber, Inc., South Bend, Ind.

Filed Sep. 24, 1984, Ser. No. 653,332

Int. Cl.[4] F16L *3/00*

U.S. Cl. 248—60 **2 Claims**

1. A corrosion-proof hanger for automotive exhaust systems and the like comprising: an elongate strap of fiber-reinforced, cured rubber composition, having spaced-apart, fastener-receiving apertures; and a tubular bushing of molded rubber material snugly mounted in at least one of said apertures,



whereby to combine the respective strength, shock-damping, vibration-isolating and heat-insulating properties of said fiber-reinforced cured rubber composition and said molded rubber material.

4,796,842

SWIVEL SUPPORT STRUCTURE FOR AN ELECTRIC APPARATUS

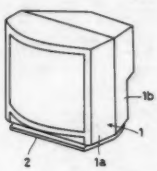
Takashi Hamada; Teruyuki Hino; Takashi Nodama, and Hiroshi Matsuoka, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,118

Claims priority, application Japan, Mar. 5, 1986, 61-32732[U]; Mar. 5, 1986, 61-32733[U]; Mar. 5, 1986, 61-32734[U]; Mar. 5, 1986, 61-32735[U]; Mar. 5, 1986, 61-32736[U]; Mar. 5, 1986, 61-32737[U]; Mar. 5, 1986, 61-32738[U]; Mar. 5, 1986, 61-32739[U]; Mar. 5, 1986, 61-32740[U]

Int. Cl.[4] F16M *11/08*

U.S. Cl. 248—186 **40 Claims**



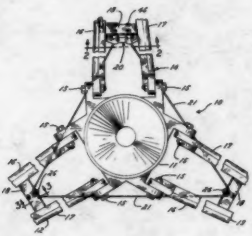
1. A remote-controlled, motor-driven swivel support structure which comprises a console; a pedestal for the support thereon of the console for angular movement from a neutral position to any one of leftward and rightward positions, said pedestal comprising a stationary and a generally ring-shaped turntable rotatably mounted thereon, said turntable having a generally ring-shaped driven bevel gear provided thereon in concentrical relationship with the axis, about which the console is rotatble, so as to face upwardly, said pedestal also including a plurality of roller assemblies arranged in a circular row concentrical with the turntable and spaced a predetermined distance from each other in a direction circumferentially of the turntable for the support of the weight of the console; and a drive mechanism including remote-controlled, reversible drive motor and a drive bevel gear drivingly coupled with the drive motor, said drive bevel gear being so positioned as to partially protrude outwardly downwardly from the bottom of the console for engagement with the driven bevel gear on the turntable, the engagement between the drive bevel gear and the driven bevel gear taking place when the console is mounted on the pedestal from above.

4,796,843

CABLE TRIPOD SPREADER

Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

Filed Nov. 5, 1987, Ser. No. 116,960
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—168 3 Claims



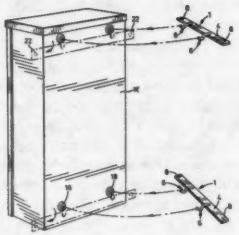
1. An instrument supporting tripod comprising, in combination, three legs adapted to be supported from a substantially parallel transport position to a spread support position, means interconnecting said legs including a flexible cable, a spring biased drum for receiving said cable in spooled relation, said spring bias being sufficient to drive the drum to spool on said cable after the cable has been pulled from the drum as the legs move to said spread support position, a locking device for positively preventing rotation of said drum, and means for operating said locking device to lock or release said drum.

4,796,844

BRACKET FOR USE IN SECURING AN ELECTRIC METER BASE

Ronald Barker, 17 Satok Terrace, West Hill, Ontario, Canada M1E 3N4

Filed Nov. 27, 1987, Ser. No. 125,690
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—222.2 3 Claims



1. A bracket for attaching an electric meter base to an exterior wall of a building, the base having at least one pair of mounting passages opening through its rear wall, each pair of mounting passages being spaced a predetermined first distance from an adjacent end of the base, the rear wall of the base having a predetermined width between its side edges, said bracket comprising;

(a) a mounting strap having a front face extending in a first plane, a pair of end portions at opposite ends thereof and an upper edge, said strap having a length between said end portions which is at least equal to said predetermined width of the rear wall of the base whereby said end portions may project laterally from the side edges of said base in use, and openings opening through said opposite end portions for mounting said bracket on a wall with the front face remote from the wall;

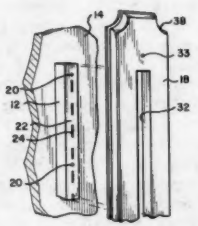
(b) a pair of hook members each having a shank portion and a curved end portion which projects from the shank portion and terminates at a free distal end, the curved end portion being proportioned to extend through the mounting passages in a free fitting sliding relationship, the hook members being mounted on or formed from the mounting strap and spaced from one another so as to be alignable with said mounting passages, said hook portions being arranged to extend from the upper edge of the strap and projecting from said first plane in an arc of curvature which initially extends forwardly from the front face of said strap and then back toward the first plane to locate said distal end in a spaced relationship with respect to said first plane to form a box retaining gap therebetween which is narrower than said first distance such that in use hook member must be threaded through the mounting passages before the bracket is mounted on a wall and the base cannot be removed from the hook members when the bracket is secured to the wall.

4,796,845

SUPPORT DEVICE FOR MODULAR WALL UNIT

Edmond R. Regel, 6761 Oldstage Rd., Boulder, Colo. 80302

Filed Aug. 7, 1987, Ser. No. 83,526
Int. Cl.[4] E04G *3/08*
U.S. Cl. 248—243 20 Claims



1. In a modular wall unit support system including in combination an elongate support member mountable to a vertical surface, said support member including an inward face and an outward face and a depth dimension, means for mounting said inward face of said support member to said vertical surface, and further including means for receiving one or more load bearing members, said receiving means being spaced longitudinally along said outward face of said support member; and said load bearing members providing a base to which a load can be secured, each load bearing member including means for engaging said receiving means of said support to adjustably located and detachably mount said loading bearing member to said support member, wherein the improvement comprises:

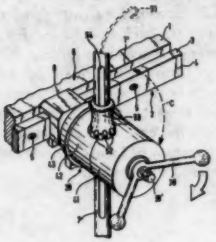
a unitary elongated pilaster, said pilaster including an inward face and an outward face and a depth dimension, and defining a substantially centrally elongate opening, said opening being sized and shaped to surround and substantially firmly engage a support member mounted on a vertical surface, and provide firm lateral support and firm vertical support to such a support member when such a support member has a load bearing member mounted on it and loading forces are imposed on such a load bearing member.

4,796,846

RETAINING DEVICE FOR A SURGICAL INSTRUMENT

Hans Meier, Mellingen, Switzerland, and Nash Aussenberg, New York, N.Y., assignors to Automated Medical Products, Corporation, New York, N.Y.

Filed Jun. 1, 1987, Ser. No. 55,925
Int. Cl.[4] E04G 3/00
U.S. Cl. 248—286 7 Claims



1. A retaining device, especially for holding a surgical instrument, comprising:

a holder block adapted to be displaceably securable along a guide rail;

said holder block being provided with clamping elements for fixedly engaging said holder clock with said guide rail;

support means for holding the surgical instrument and displaceably supported by said holder block;

clamping means provided for said holder block and serving for allowing displacement of said support means and for arresting said support means in a desired position;

said clamping means being rotatable with respect to said clamping elements;

actuating means for simultaneously actuating said clamping means and said clamping elements during arresting of said support means in a desired position;

said clamping means comprising a fixed clamping jaw and a movable clamping jaw;

said holder block comprising a guide body for supporting said clamping means;

said clamping means being displaceably and rotatably mounted at said guide body;

said actuating means comprising tightening means cooperating with said clamping means and serving for simultaneously tightening said clamping means and clamping said clamping elements at the guide rail;

said holder block comprising a substantially horseshoe-shaped body member;

said fixed clamping jaw being arranged at said substantially horseshoe-shaped body member;

said substantially horseshoe-shaped body member of said holder block further comprises two arm members;

a pivot pin arranged between said two arm members;

spring means disposed about said pivot pin;

said movable clamping jaw being mounted upon said pivot pin for pivotable movement between an open position and a closed position;

said movable clamping jaw being biased into said open position by said spring means;

said guide body being provided at said substantially horseshoe-shaped body member and serving to displaceably and rotatably mount said clamping means;

said clamping means comprising a bipartite clamping mechanism composed of two clamping parts; and

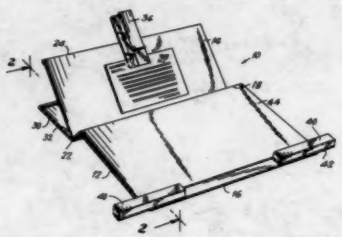
each of said two clamping parts having a pair of coaxially arranged recesses extending transverse to said guide body.

4,796,847

DESKTOP ORGANIZER

Morris Kayner, 8800 Boulevard East, North Bergen, N.J. 07047

Filed Sep. 30, 1987, Ser. No. 103,427
Int. Cl.[4] A47B 19/00
U.S. Cl. 248—441.1 11 Claims



1. A unitary desktop organizer operatively positionable in self-supported freestanding relation on a desktop for selectively and concurrently supporting a plurality of articles in positions facilitating the availability and use of the articles, comprising:

a first substantially planar member operatively disposed at a first angle relative to the desktop and extending from a front edge for supported abutment with the desktop to a rear edge vertically upwardly spaced from the desktop to define a first article support surface;

a second substantially planar member operatively disposed at a second angle relative to the desktop and extending from a front edge for supported abutment with the desktop to a rear edge vertically upwardly spaced from the desktop to define a second article support surface, said second angle being greater than said first angle;

a third substantially flat planar member unitarily connecting said first member rear edge and said second member front edge and defining an article capturing trough between said first and said second members; and

a substantially planar base member unitarily connected to said second member front edge and extending rearwardly therefrom along and supportedly on the desktop to define a third article support surface, said base member and second member defining therebetween an article storage area; and wherein said first and second members are constructed at least in part of ferromagnetic material so as to provide at least portions of said first and second article support surface to which articles having magnetic means are magnetically cooperably retainable; and further comprising article retaining means including a surface having a magnetic portion for magnetically cooperable and releasable retention of said article retaining means to at least one of said first and second members for facilitating support of articles of said organizer.

4,796,848

PLASTIC-CLAD, ELECTRICALLY INSULATED, METAL PIPE HANGER

Donald D. Lanz, 15702 S. Neibur Rd., Oregon City, Oreg. 97045

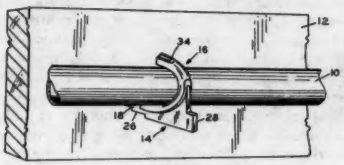
Filed Mar. 30, 1987, Ser. No. 31,582
Int. Cl.[4] F16B 15/00
U.S. Cl. 248—71 2 Claims

1. A pipe hanger comprising:

(a) a metal stud-like shank segment and an integral metal, pipe-receiving hook segment merging with the shank segment through an inwardly facing throat segment, and

(b) a sheath of electrically insulating flexible plastic tubing having a substantially half-round inner end segment over-

lying the inner surface of the throat segment and a tubular segment outwardly of the inner end segment encircling at least a portion of the hook segment and overlying the inner surface of the hook segment.

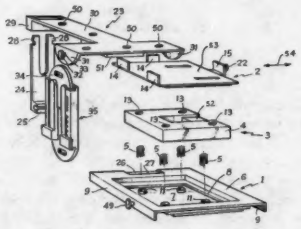


4,796,849

ANTI-VIBRATION MOUNTING DEVICE FOR A COMPACT DISK PLAYER

Jean P. Fouassier, Cachan, France, assignor to Armodel S.A., Fontenay aux Roses, France

Filed Oct. 22, 1987, Ser. No. 111,275
Claims priority, application France, Jan. 7, 1987, 87 00085
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—619 **28 Claims**



1. An anti-vibration device for attaching an article to a movable vehicle comprising:
(a) a generally planar base;
(b) a support plate defining a supporting surface;
(c) clamping means mounted on the support plate such that at least a portion of the clamping means extends above the supporting surface for removably clamping the article to the support plate;
(d) spring means mounted between the base and the support plate;
(e) a layer of vibration dampening foam material attached to the base and to the support plate to attach the support plate to the base so as to minimize the transmission of vibrations from the base to the support plate; and,
(f) mounting means to attach the base to the vehicle.

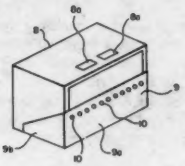
4,796,850

COOKING APPARATUS FOR MOUNTING ON A WALL

Yoshihiro Aramaki, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 37,061, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 826,756, Feb. 6, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 186,766
Claims priority, application Japan, Mar. 14, 1985, 60-37831[U]
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—674 **2 Claims**

1. A cooking apparatus for mounting on a wall comprising a front structure and a back structure which are removably attachable to each other to form together a housing for said apparatus, said back structure including back and bottom plates which form portions of said housing, said back structure being directly attached to a wall surface, said apparatus becoming mounted on said wall surface with said front structure becoming secured to said back structure; and
wherein said back structure further includes side plates, said front structure also includes side plates, and said side plates of said front and back structures fit together to form side walls of said housing; and
wherein said housing is slidably attachable to said back structure.

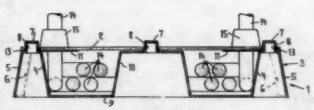


4,796,851

REINFORCING ROD HOLDER FOR USE IN JOINING CAST CONCRETE WORK

Fritz Brechbuehler, Muensingen, Switzerland, assignor to Pebea, N.V., Curacao, Netherlands Antilles

Filed Jan. 14, 1987, Ser. No. 3,266
Claims priority, application European Pat. Off., Jan. 15, 1986, 86810014.0; Mar. 24, 1986, 86810139.5
Int. Cl.[4] E04B *1/41*
U.S. Cl. 249—91 **21 Claims**



1. A reinforcing rod holder for use in joining cast concrete work comprising:
a box-shaped body adapted to receive free ends of reinforcing rods;
a cover means removably secured to said body, for substantially enclosing said body; and
an embedding means for embedding said cover means in a concrete mass, apart from said body, while said cover means is removably secured to said body, said embedding means comprising a recess means formed in said box-shaped body for permitting concrete to pass behind said cover means when the holder is embedded in concrete.

4,796,852

Patent Not Issued For This Number

4,796,853

REMOTELY CONFIGURABLE SOLENOID DRIVER CIRCUIT FOR DIRECT PRESSURE ELECTRONIC TRANSMISSION CONTROL

Kenneth R. Butts, Grosse Pointe Woods, and Joseph L. Wanamaker, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

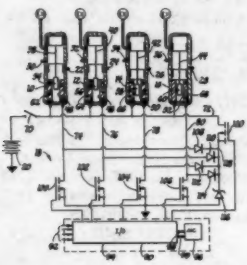
Filed Dec. 22, 1987, Ser. No. 136,331
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **5 Claims**

1. In a motor vehicle multi-speed ratio transmission including a source of fluid pressure, a source of direct current, and a plurality of electromagnetic valves which receive fluid from said fluid source, and are adapted to be individually and intermittently energized with said current source during shifting modes of operation in which at least one of such valves is

alternately opened and closed to supply fluid at a pressure lower than said fluid source, and nonshifting modes of operation in which the energized valves are maintained fully opened to supply fluid substantially at the pressure of said fluid source, a driver circuit for controlling energization of said valves, comprising:

energization circuit means including battery means connected to an unswitched terminal of each of said valves, and plurality of selectively activated power switching devices, each having a pair of current carrying terminals connected between said battery means and a switched terminal of a respective one of said valves to form selectively activated energization circuits for each of said valves;

current interruption/protection means including a Zener diode connected across the current carrying terminals of



each of said power switching devices, in each case, through an oppositely poled diode associated with the respective power switching device, such means being operative during said shifting modes of operation to interrupt the current supplied to the valves between intermittent energizations thereof while limiting the electromagnetic voltage thereby generated across the respective power switching devices; and

current sustaining means effective during said nonshifting modes of operation for connecting a junction between said Zener diode and said oppositely poled diodes to the unswitched terminals of each of said valves, thereby to disable the operation of said current interruption/protection means, and to connect said oppositely poled diodes across the respective valves for sustaining the current in such valves between intermittent energizations thereof.

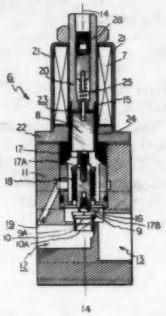
4,796,854

BALANCED SOLENOID VALVES

James H. Ewing, Brockton, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Filed May 18, 1987, Ser. No. 50,900
Int. Cl.[4] F16K *31/02, 39/02*
U.S. Cl. 251—129.07 **2 Claims**

1. Fluid valving apparatus comprising a valve body having fluid inlet and outlet ports, a valve seat having a passageway for connecting said ports, a valving member, a stem structure fixed with said valving member, substantially frictionless means suspending said stem structure in said body in support of said valving member for movements thereof along an axis toward and away from said seat in nearby positions where fluid pressure differences appear across said valving member and create first net forces tending to move said valving member in one direction along said axis, solenoid control means for moving and setting the position of said valve stem structure and valving member along said axis to govern flow of fluid between said ports through said seat passageway, said solenoid control means including an electrical solenoid winding fixed with said body and a cooperating relatively movable armature of magnetic material fixed with and movable with said stem structure along said axis, said substantially frictionless means including at least a pair of flat springs connected between said stem structure and said body at axially-spaced positions along said axis, yieldable frictionless motion-accomodating seal means connected fluid-tight between said stem structure and said valve body and allowing substantially frictionless relative movement therebetween along said axis, said motion-accommodating seal means comprising a metal bellows defining a closed path along which it accommodates said relative movements whose enclosed effective area, transverse to said axis, is about the same as that of said seat passageway and the confronting surfaces of said valving member, transverse to said axis, means exposing those surface areas of said stem structure



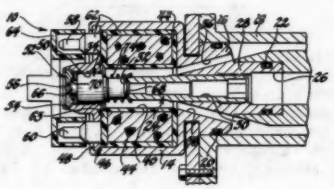
which are transverse to said axis and lie to one side of the seal provided by said motion-accommodating seal means to pressures at said inlet and simultaneously exposing those surfaces of said stem structure which are transverse to said axis and lie to the other side of the seal provided by said motion accommodating seal means to pressures at said outlet, whereby said stem structure is subjected to second net forces along said axis which are related to differences in pressures at said inlet and outlet and which are of substantially the same magnitude as said first net forces and in direction opposite thereto, and adjustable biasing-spring means exerting force between said body and said stem structure along said axis in direction to bias said valving member toward closure with said seat.

4,796,855

PWM ELECTROMAGNETIC VALVE WITH SELECTIVE CASE HARDENING

Jay K. Sofianek, Livonia, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 15, 1988, Ser. No. 168,483
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.15 **4 Claims**



1. A pulse-width-modulated valve having an armature axially movable between a first position in which it is seated against a first seat, and a second position in which it is seated against a second seat, resilient means for biasing the armature into engagement with the first seat, and magnetic circuit means

selectively activatable to establish a flow of magnetic flux through a flux path including the armature and the second seat for overcoming the bias of said resilient means and moving the armature into engagement with the second seat, the improvement wherein:

the armature and second seat are formed of magnetic flux conducting material;

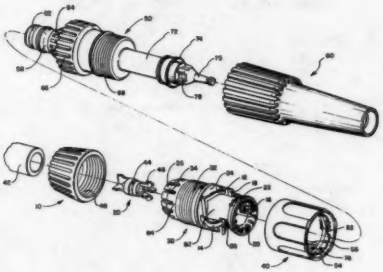
the surfaces of the armature and second seat which come into direct contact upon activation of said magnetic circuit means are case hardened to minimize wear and residual magnetization thereof; and

the surfaces of the armature and second seat which are adjacent such direct contact surfaces are substantially free of the case hardening to permit substantially unrestricted flow of magnetic flux between the armature and second seat during activation of said magnetic circuit.

4,796,856
WATERTIGHT JOINT FOR FLEXIBLE PIPES

Dino Munini, S. Quirino, Italy, assignor to Protec Pordenonese S.p.A., S. Quirino, Italy

Continuation-in-part of Ser. No. 922,081, Oct. 21, 1986, abandoned. This application Sep. 11, 1987, Ser. No. 96,630
Claims priority, application Italy, Oct. 22, 1985, 83429 A/85
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.5 **18 Claims**



1. A removably coupling watertight joint comprising:

a male element having a fluid passageway therethrough, at least one engaging notch, and means for providing an external watertight seal;

a female element having a mating portion for receiving the male element, means for coupling a tubular device to the female element, and a shoulder separating the mating portion from the coupling portion, said coupling portion and said mating portion forming a fluid passageway through the female element;

at least one flexible clasping tongue having an inwardly projecting tooth, said clasping tongue being integrally molded to the shoulder of said female element;

at least one opening positioned on the mating portion of the female element through which a corresponding projecting tooth of the clasping tongue may move to engage the engaging notch of the male element;

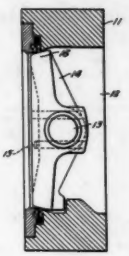
a generally cylindrical joint coupling bushing surrounding the mating portion of the female element which is longitudinally slidable in relation to said female element, said bushing having at least one internal projection which causes the elastic clasping tongue to deflect inwardly and engage the engaging notch on the male element; and

means for biasing the joint coupling bushing in a lock position such that the clasping tongue is deflected inwardly in order to engage the engaging notch on the male element, said biasing means being integrally molded to the shoulder of the female element.

4,796,857
METALLIC SEAL FOR HIGH PERFORMANCE BUTTERFLY VALVE

William R. Hayes, Cincinnati, Ohio, and Allan K. Shea, Erie, Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 3, 1987, Ser. No. 128,282
Int. Cl.[4] F16K *1/22, 25/00*
U.S. Cl. 251—173 **11 Claims**



1. In a valve of the type having a casing provided with a through passage for fluid, a rotatable valving member supported in said passage for rotational movement between valve-closed and valve-open positions and having spherical outer surface portions forming a sealing surface, and an annular seal mounted in said casing and surrounding said valving member and contacting said sealing surface in the valve-closed position of said valving member, the improvement characterized by

(a) said flexible annular seal being of thin sheet metal construction and having its radially outer annular edge portions clamped in sealed relation to said valve casing, in a mounting plane transverse to said passage,

(b) said flexible annular seal having its radially inner annular portions arranged to have self-pressed, resilient wiping contact with the spherical outer surface portions of said valving member in its valve-closed position in order to establish a low pressure fluid seal between the higher pressure (upstream) and lower pressure (downstream) sides of said valve casing,

(c) the radially inner annular portions of said flexible annular seal extending in inclined relation to said spherical outer surface portions and contacting said surface portions in regions thereof offset in an upstream direction from the intersection with said surface portions of a line normal to said spherical outer surface portions and projected to the radially outermost unsupported portions of said flexible annular seal, whereby upstream fluid pressure acting upon unsupported portions of said annular seal tends to press it more tightly against the spherical outer surface portions of said valving member,

(d) said flexible annular metal seal being initially unsupported for a substantial distance radially outward from the spherical outer surface portions of said valving member to accommodate flexing of radially intermediate portions of said annular seal,

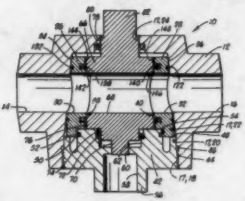
(e) said casing having an annular abutment positioned on the downstream side of said flexible annular seal and adapted, upon predetermined deflection of the unsupported seal portions in a downstream direction in response to increasing pressure differential, to engage and support an intermediate annular support region of the previously unsupported flexible seal portions.

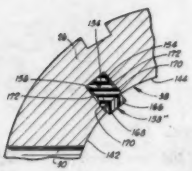
4,796,858

DUAL SEAL VALVE

Terry D. Kabel, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 1, 1987, Ser. No. 104,721
Int. Cl.[4] F16K *15/14*
U.S. Cl. 251—171 **18 Claims**





1. A valve comprising:

body means having inlet means and outlet means thereon and defining a central cavity therein in communication with said inlet and outlet means;

insert means disposed in said central cavity and defining an opening therethrough in communication with at least one of said inlet and outlet means;

valve means disposed in said central cavity and rotatable with respect to said body means and said insert means, said valve means defining an opening therethrough in communication with said opening in said insert means when said valve means is in an open position and spaced from said opening in said insert means when in a closed position, one of said valve means and said insert means having a sealing surface thereon and the other of said valve means and said insert means defining a seal groove therein adjacent said sealing surface; and

composite seal means disposed in said seal groove and comprising:

a relatively hard, high lubricity element adapted for sealing engagement with said sealing surface; and

a relatively soft, elastomeric element integrally connected to said hard element and adapted for resiliently biasing said hard element toward said sealing surface,

wherein a radial side wall of said composite seal means defines an annular concave groove therealong such that at least a portion of said side wall of said elastomeric element is spaced from a corresponding side wall of said seal groove.

4,796,859

SLIT LAMP ASSEMBLY

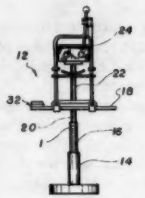
Lori M. Ventura, 801 N. Venetian Dr., Apt. 1104, Miami, Fla. 33139

Filed Jan. 14, 1988, Ser. No. 144,306
Int. Cl.[4] A61B *3/00, 3/10*
U.S. Cl. 351—245 **9 Claims**

1. For use after eye examinations, the combination of a slit lamp assembly including (a) a stand, (b) a table on the stand, (c) means to adjust the table height relative to the stand, and (d) a slit lamp including a tonometer head carried on the table, and

a container having a swab discharge opening,

means on the table to removably connect the container to the table, and



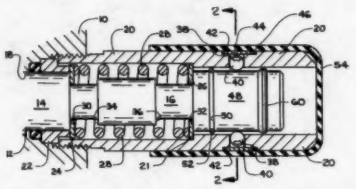
a plurality of alcohol impregnated swabs in the container for withdrawal of the swabs through the opening for use to clean the head.

4,796,860

VALVE SPOOL DETENT

Robert M. Diel, Hutchinson, Kans., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 16, 1987, Ser. No. 109,050
Int. Cl.[4] F16K *35/04*
U.S. Cl. 251—297 **11 Claims**



1. A valve spool detent device, comprising the combination of:

a valve body having a first bore therein;

a valve spool slidably positioned in the first bore having inner and outer portions, the force for operating the valve being applied to the inner spool portion;

a detent assembly surrounding the outer spool portion including a sleeve attached to the body, the sleeve including a plurality of radially spaced holes therein in a common plane;

a plurality of balls positioned in the holes of the sleeve;

a c-shaped adjustable bias spring means positioned on the outside of the sleeve covering each of the radial holes in said sleeve;

the outer portion of the spool including a cylindrical surface passing through said plane including a circumferential outwardly extending lug means which engages the plurality of balls and c-spring as the lug means approaches said plane.

4,796,861

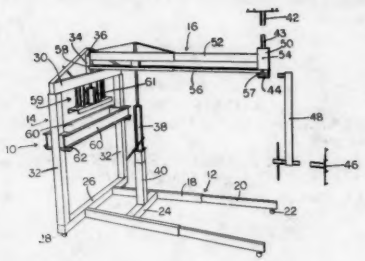
PORTABLE RAM, ENGINE STAND AND TRANSMISSION CRADLE

James W. Petty, Rolla, Mo., assignor to Donald W. Petty, Rolla, Mo., a part interest

Filed Sep. 28, 1987, Ser. No. 101,823
Int. Cl.[4] B66F *5/02*
U.S. Cl. 254—8 B **10 Claims**

1. A lifting jack for automotive transmissions, engines and the like and a ram press, said lifting jack comprising a horizon-

tally extending base, a support frame extending vertically from an end of said base, a horizontally extending boom pivotally connected to a top portion of said support frame, said boom having a free end extending over said base and having means



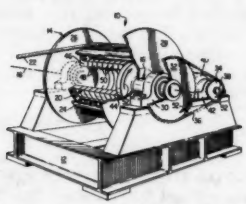
for supporting simultaneously a transmission cradle and an engine stand, jack means supported on said base bearable upon said boom for raising and lowering said boom, said ram press being supported upon said support frame and being operable independently of said boom and said jack means.

4,796,862

WINCH COMPENSATOR

George W. Peppel, Arlington, Tex., assignor to Lockheed Corporation, Calabasas, Calif.

Continuation of Ser. No. 897,722, Aug. 18, 1986, abandoned.
This application Dec. 4, 1987, Ser. No. 128,990
Int. Cl.[4] B66D *1/14*; F16F *1/14, 1/36*
U.S. Cl. 254—277 12 Claims



1. A winch, comprising:

a drum for receiving a cable, said drum having a cylindrical portion, the cable being received on the exterior of the cylindrical portion;

means for supporting said drum for rotation about an axis;

a drive element having a portion extending within the interior of the cylindrical portion of the drum;

means for supporting said drive element for rotation about the axis;

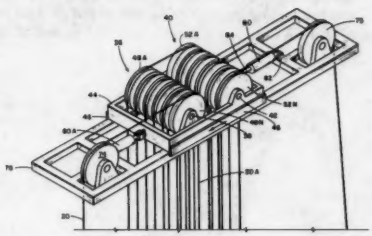
an unpreloaded cylindrical elastomeric element connected between the drum and drive element within the cylindrical portion of the drum for torsional deformation about the axis, said elastomeric element transmitting torque between the drum and drive shaft to absorb shock loading in the cable.

4,796,863

DUAL CLUSTER CROWN BLOCK

Lowell M. Reed, Moore, Okla., assignor to Parco Mast and Substructures, Inc., Del City, Okla.

Filed Oct. 23, 1986, Ser. No. 922,201
Int. Cl.[4] B66D *3/08*
U.S. Cl. 254—337 2 Claims



1. A crown block unit for use on a derrick in which the derrick is provided with a drum and drawworks and a dead line tie down which comprises:

a support frame mounted at the top of a derrick;

a traveling frame slidably mounted on said support frame;

a first cluster of a plurality of sheaves having a first common axle supported by said traveling frame;

a second cluster of a plurality of sheaves having a second common axle supported by said traveling frame and in a position parallel to said first axle;

a traveling block unit having a third cluster of sheaves all having a third common axle and a fourth cluster of sheaves all having a fourth common axle, a cross member connecting said third and fourth common axle and means for connecting the load to said cross member;

a single continuous cable having a first end and a second end with said first end attached to said drum and extending upwardly over said first cluster and downwardly to said third cluster, and repeated until a plurality of the sheaves on said first and third cluster are utilized, and then to said second cluster and downwardly about said fourth cluster and back up over said second cluster and repeated until a plurality of the sheaves in said second and fourth clusters are utilized and then said second end of said cable is connected to said deadline tiedown.

4,796,864

SPRING LOADED DROP FOOT TRAILER JACK

James E. Wilson, Chickasha, Okla., assignor to Stallion Trailer Kits, Inc., Chickasha, Okla.

Filed Oct. 26, 1987, Ser. No. 113,254
Int. Cl.[4] B60S *9/02*
U.S. Cl. 254—425 11 Claims

1. An apparatus for at least partially supporting a portion of a wheeled vehicle, said apparatus comprising:

a tubular outer housing for attaching to said vehicle and having an upper end and an open lower end;

a second tubular member slidably disposed within said tubular outer housing, said second tubular member defining an aperture in a wall thereof;

a third tubular member having upper and lower portions and slidably disposed within said second tubular member, said third tubular member defining a series of spaced openings in a wall thereof selectively alignable with said aperture in said second tubular member;

biasing means located within said third tubular member for biasing said third tubular member toward a retracted position with respect to said second tubular member;

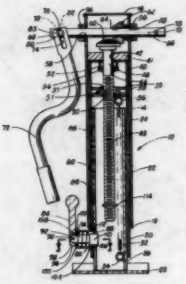
locking means for securing said second and third tubular members from relative movement therebetween when

said locking means is actuated, said locking means comprising:

a pin case extending from a wall of said second tubular member adjacent said aperture;

a pin slidably disposed in said pin case and having a first portion and an enlarged second portion;

a plate with an aperture defined therein for allowing passage of said first portion of said pin therethrough, and preventing passage of said enlarged second portion of said pin from said pin case, adjacent an end of said pin case;



a lever pivotally engaging said first portion of said pin, and movable from a first position wherein said pin engages one of said openings in said third tubular member to a second position wherein said pin is removed from engagement with said one of said openings; and

a spring abutted against said plate and said enlarged second portion of said pin; and

a vehicle support member attached to said lower portion of said third tubular member.

4,796,865

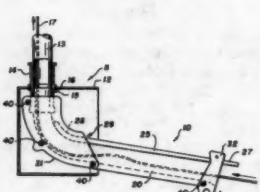
FISHTAPE FEEDING TOOL

Steve Marchetti, 6827 E. Broadway, Burnaby, British Columbia V5B 2Y7, Canada

Filed Jun. 29, 1987, Ser. No. 67,156

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.3 FT **11 Claims**



1. A fishtape feeding tool adapted to be held in position relative to a conduit, comprising:

an elongated hollow body having a generally straight section at a first end and a curved section at a second end, said first and second end being open, said body having a slot extending longitudinally between said open ends to enable said tool to be removed from said fishtape;

receptacle means at said second end;

a hollow cylindrical plug having a first end adapted to be received by said receptacle means and a second end for inserting in said conduit, said plug having a slot longitudinally thereof adapted to be aligned with said body slot when said tool is removed;

removable cover means for attachment to said body to cover said slot from said first open end to a point near said second end; and

resilient clamp means for holding said cover means to said body.

4,796,866

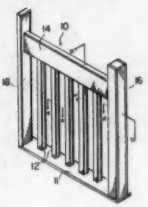
RAILING STRUCTURE

Jocelyn C. Garneau, 1, rue Verret, St-Emile, Quebec, Canada G0A 3N0

Filed Jul. 24, 1987, Ser. No. 77,507

Int. Cl.[4] E04H *17/14*

U.S. Cl. 256—59 **8 Claims**



1. An upright for railing comprising an elongated core member made of a material having a weak resistance to bending, the said core member having a rectangular cross-section surrounded by a front and a rear face and two lateral faces, the said front and rear faces being provided with a longitudinal groove and the said lateral faces being covered by a thin protective sheet, facing plates made of solid and rigid material covering said front and rear faces, each of said plates being provided with a ridge correspondingly fitting in one of said grooves, the said facing plates being adheringly mounted to said core member. A block member made of solid material adheringly fitted in a recess provided in the lower end of said core member, means for securing said block member to a base member, the said core member being provided at its upper end with a perforation emerging in said groove, the said perforation adapted to receive a screw hidden from view by one of the facing members for threadedly engaging said upright to an adjacent structure.

4,796,867

APPARATUS FOR THERMAL DEBURRING OF PARTS

Valery P. Bozhko; Sergei V. Yatsenko; Vitaly E. Strizhenko; Alexei V. Losev; Viktor I. Pleshkov, and Viktor M. Junash, all of Kharkov, U.S.S.R., assignors to Kharkovsky Aviatsionny Institut, Kharkov, U.S.S.R.

PCT No. PCT/SU86/00037, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/06510, PCT Pub. Date Nov. 5, 1987

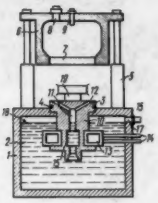
PCT Filed Apr. 30, 1986, Ser. No. 165,267

Int. Cl.[4] C21D *9/00*; B23K *7/06*

U.S. Cl. 266—51 **3 Claims**

1. An apparatus for thermal deburring of parts comprising a working chamber (6) and a bottom member (3) for sealing the chamber (6) which are mounted for a movement relative to each other, an inlet valve (8) for admission of a fuel gas mixture to the chamber (6), a spark plug (9) in the chamber (6) and an outlet valve for discharging combustion products from the chamber (6), characterized in that it is provided with a vessel (1) containing a liquid (2) and an annular cooling chamber (13) accommodated in the vessel (1), the outlet valve comprising a

rod (10) having a through passage (11) having one end thereof communicating with the interior of the chamber (6) and the



other end disposed in the vessel (1) containing liquid (2) and surrounded by the annular cooling chamber (13).

4,796,868

APPARATUS FOR THERMAL DEBURRING OF PARTS

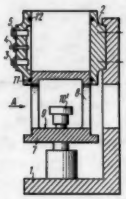
Valery P. Bozhko; Alexei V. Losev; Vitaly Strizhenko; Viktor I. Pleshkov, all of Kharkov, and Ivan A. Levityansky, Leningradskaya, all of U.S.S.R., assignors to Kharkovsky Aviatsionny Institut, Kharkov, U.S.S.R.

PCT No. PCT/SU86/00038, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/06511, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 30, 1986, Ser. No. 165,263

Int. Cl.[4] C21D *9/00*; B23K *7/00*

U.S. Cl. 266—51 2 Claims



1. An apparatus for thermal deburring of parts, comprising a cylindrical working chamber (2) with admission and discharge valves (3,5) and a spark plug (4), a bottom member (7) for closing and opening the chamber (2) provided with a worktable (9) for supporting parts (10) being treated, movably mounted along the axis of the chamber (2), and an elastic sealing ring (11) for sealing the joint between the bottom member (7) with the chamber (2), characterized in that the bottom member (7) comprising a hollow cylinder with end plates and openings (8) in the peripheral wall, the height and the outside diameter of the cylinder being approximately equal to the height and outside diameter of the working chamber (2), while the apparatus is provided with an additional sealing ring (12) interposed between the chamber (2) and the hollow cylinder on the side opposite to a loading hole in the chamber (2).

4,796,869

SUSPENSION AND ANCHORAGE DEVICE FOR A RAIL-MOUNTED MOVABLE PLUGGING MACHINE FOR METALLURGICAL FURNACES

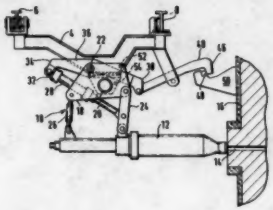
Pierre Mailliet, Howald, and Jean Metz, Luxembourg, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Sep. 11, 1987, Ser. No. 95,568

Claims priority, application Luxembourg, Sep. 30, 1986, 86612

Int. Cl.[4] C21B *7/12*

U.S. Cl. 266—271 6 Claims



1. Suspension and anchoring device for a rail-mounted movable machine for use in conjunction with metallurgical furnaces, the machines being suspended on cradle means suspended on said rails, said machine being movable by means of a parallelogram configured guide bar system actuated by an operating cylinder for shifting the machine between a work position and a travel position and further comprising:

pivotable lever means provided on said cradle means, said lever means having opposed first and second ends;

an operating cylinder having opposed first and second ends, said operating cylinder being articulated at said first end to link plate means of said parallelogram guide bar system and at said second end to said first end of said pivotable lever means;

anchorage hook means articulated to said second end of said lever means;

means for receiving said anchorage hook means on said metallurgical furnace, said receiving means mating with said hook means;

wherein when said machine is in a work position, said operating cylinder supports itself at said first end such that said lever means pivots in a first direction and said hook means is brought into engagement with said hook receiving means; and

wherein when said machine is in a travel position, said operating cylinder supports itself at said first end such that said lever means is pivoted in a second direction and said hook means comes out of engagement with said hook receiving means.

4,796,870

SUSPENSION SYSTEM FOR VEHICLES CONTAINING COMBINATION ISOLATOR MOUNT AND AIR SPRING CLOSURE

Keith E. Hoffman, Atlanta, and Wayne H. Geno, Cicero, both of Ind., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 18, 1987, Ser. No. 50,812

Int. Cl.[4] B60G *11/62*; F16F *9/04*; F16J *15/50*; B25G *3/34*

U.S. Cl. 267—35 20 Claims

1. An improved air spring suspension system for vehicles including:

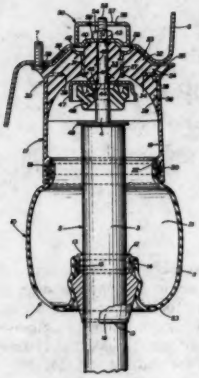
(a) a fluid shock absorber strut having an outer cylinder and a reciprocal piston rod;

(b) first attachment means for mounting the cylinder on a first vehicle support structure;

(c) a fluid pressure chamber formed by a canister and a flexible sleeve sealingly connected to and extending be-

tween said canister and the cylinder, said pressure chamber adapted to contain a supply of pressurized fluid with said piston rod and cylinder extending through said pressure chamber; and

(d) an isolator unit for mounting the canister on a second vehicle support structure spaced from the first vehicle support structure and for closing an open tope of the canister, said isolator unit comprising an end cap adapted to be secured to said second vehicle support structure and an isolator formed of an elastomeric material bonded to



said end cap and to said canister which is spaced below said end cap; said isolator being an integral one-piece member having generally concave bottom surface forming a generally dome-shaped end closure for the air spring, a central portion formed with an axially extending opening for passage of the piston rod therethrough and adapted to be placed in compression when the isolator unit is mounted on a vehicle, said isolator furthermore having an intervening portion located between a lower surface of the end cap and an upper surface of the canister for bonding the end cap to the canister.

4,796,871

GAS SPRING WITH END POSITION DAMPING

Hans-Peter Bauer; Hans J. Bauer; Ludwig Stadelmann, and Emil Frisch, all of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer & Söhne oHG, Altdorf, Fed. Rep. of Germany

Filed Jun. 10, 1987, Ser. No. 61,826

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623787

Int. Cl.[4] F16F *5/00, 9/49*

U.S. Cl. 267—64.11 **17 Claims**

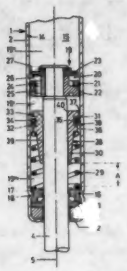
8. A gas spring with plural damping phases, comprising

a piston rod disposed axially in a cylindrical housing having a first closed end and a second end through which said piston rod sealingly extends out from said housing and retracts thereinto, said housing containing at least one fluid and at least partially filled with a gas under pressure,

a damping piston disposed on the end of said piston rod in said housing,

an independent auxiliary piston provided about and guided on said piston rod between said damping piston and said second end of said housing, said auxiliary piston including damping means for allowing said at least one fluid to pass with substantially more damping when said auxiliary piston is moved towards said second end of said housing than when moved towards said first end thereof, said auxiliary piston comprising at least one permanently open throttle duct and said throttle duct being formed between the piston rod and the auxiliary piston,

said damping means including energy accumulator means, and further providing that when said piston rod is extended a predetermined amount, further extension of the piston rod in the direction of said second end results in



increased damping including by said energy accumulator means, and wherein a throttle effect of the auxiliary piston is independent of the damping effect of the damping piston.

4,796,872

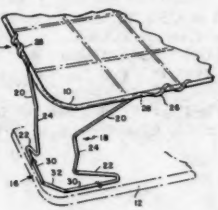
BENT WIRE SPRING MODULE

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Jul. 13, 1987, Ser. No. 72,405

Int. Cl.[4] A47C *23/02*; F16F *3/02*

U.S. Cl. 267—103 **6 Claims**



1. A bent wire spring module for disposition between a rigid, rectangular base frame comprising spaced, parallel sides and ends and a wire grid frame comprising a rectangular border wire and transversely and longitudinally-crossing grid wires attached at their ends to the border wire and bent wire spring modules at each corner of the base frame and the grid frame, each comprising a unitary length of wire embodying right-angularly disposed lower and upper attaching means and a pair of vertical supports disposed therebetween, said lower attaching means comprising integrally-connected first lengths of wire disposed at substantially right angles to each other and substantially parallel to the respective sides at the corners of the base frame for attachment thereto, said upper attaching means comprising integrally-connected second lengths of wire of helical configuration at substantially right angles to each other each disposed helically about and substantially parallel to respective sides of the border wire at a corner of the grid frame for attachment thereto, each vertical support comprising lower and upper legs, said lower legs being connected at their lower ends to the lower attaching means, means comprising lateral extensions at the upper ends of the upper legs disposed at an angle thereto such as to abut the underside of the border wire, said lateral extensions being connected at one end to the upper ends of the upper legs and at the other ends to the helical

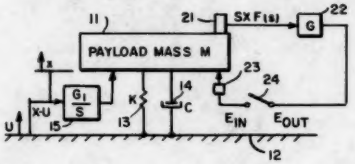
lengths of wire and said lower and upper legs at their upper and lower ends respectively being connected to each other.

4,796,873

ACTIVE VIBRATION ISOLATION SYSTEM

Dale W. Schubert, Sudbury, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Continuation of Ser. No. 716,026, Mar. 26, 1985, abandoned.
This application Apr. 28, 1987, Ser. No. 43,630
Int. Cl.[4] F16M *1/00, 13/00;* B60G *17/00*
U.S. Cl. 267—136 29 Claims



1. A vibration isolation system comprising:
a payload mass;
a support;
a passive isolation system for supporting said payload mass on said support;
a velocity transducer for sensing vibrational movement of said payload mass relative to said support and for producing a velocity transducer output signal that varies as a function of the velocity of said payload mass as it undergoes vibrational motion relative to said support;
control circuit means responsive to said velocity transducer output signal for modifying said velocity transducer output signal so that the effective resonant frequency of said velocity transducer is substantially lower than the resonant frequency of said passive isolation system;
a force transducer for applying a force to said payload mass in response to an input signal; and
signal applying means for applying said modified velocity transducer output signal as said input signal to said force transducer so as to cause said force transducer to apply a force to said payload mass in a direction opposite to the direction of movement of said mass as it vibrates.

4,796,874

ELECTRONIC HYDRAULIC MOUNT WITH CONTINUOUSLY VARIABLE CONTROL

John F. Hoying, Bellbrook, and Stanley E. Smith, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1987, Ser. No. 103,756
Int. Cl.[4] F16M *5/00*
U.S. Cl. 267—140.1 3 Claims

1. A hydraulic mount assembly providing variable damping characteristics comprising:
a pair of mounting members;
an elastomeric hollow body connected to said mounting members;
an elastomeric diaphragm closing said hollow body and forming therewith a closed cavity that is filled with liquid;
means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm, said partitioning means including an opening and first and second elongated orifices communicating in parallel relationship between said chambers, said first orifice being open providing a continuous path for flow of liquid between said primary and secondary chambers at all times;
decoupler means positioned with said opening in said partitioning means;
valve means for providing an infinitely variable rate of liquid flow through said second "flow passage" orifice between said primary and secondary chambers to provide a variable damping effect to said hydraulic mount assembly;
means for sensing vehicle operating conditions and resulting vibrations;

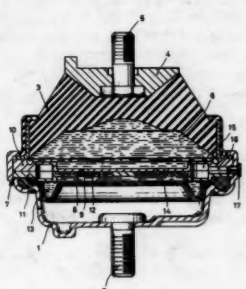
means for controlling said valve means in response to said means for sensing vehicle operating conditions so as to allow the damping characteristics of said mount assembly to be tuned.

4,796,875

HYDRAULIC MOUNTING

Theobald Mertens, Mainz, and Jurgen Roos, Trebur, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1987, Ser. No. 112,277
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701264
Int. Cl.[4] F16F *9/342*
U.S. Cl. 267—140.1 4 Claims



1. A hydraulic mounting having two chambers filled with a liquid and separated by a flexible disk, a pair of stop plates sandwiching the disk, a helical channel outside the region of the disk connecting the chambers, a filler opening leading from the channel to outside the mounting, a closure member comprising a sealing body sealingly inserted in the opening, and a throttle valve in the channel having a shaft extending out through the sealing body.

4,796,876

ENGINE MOUNT

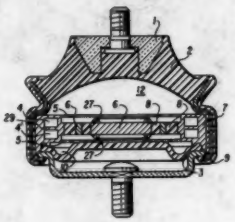
Giacomo Sciortino, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Apr. 8, 1987, Ser. No. 35,990

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617813

Int. Cl.[4] F16F *9/34*

U.S. Cl. 267—140.1 8 Claims



1. An engine mount having hydraulic damping comprising:

a bearing member, a bearing wall, and an annular bearing spring connecting said bearing member to said bearing wall, together defining a working chamber;

means comprising a resilient buffer wall defining a compensating chamber;

a partition wall disposed between said working chamber and said compensating chamber;

a compensation part movable between said working chamber and said compensating chamber disposed radially within said partition wall, said compensating part comprising a circular inertial mass;

an annular elastic diaphragm means connecting said compensating part to said partition wall;

stop means for limiting the movement of said compensating part between said working chamber and said compensating chamber; and

throttle port means for connecting said working chamber and said compensating chamber in fluid communication, with said throttle port means, said working chamber, and said compensating chamber filled with an incompressible fluid,

said throttle port means comprising a common inlet connected to said working chamber, a plurality of channels connected at one of their ends to said common inlet and at another of their ends to a common outlet, said common outlet being connected to said compensation chamber, whereby said channels are arranged in parallel to each other.

4,796,877

WORKPIECE HOLDER AND SAW GUIDE DEVICE

James C. Musil, Hudson, and Emery J. Zahuranec, Novelty, both of Ohio, assignors to Crawford Fitting Company, Solon, Ohio

Filed Mar. 7, 1988, Ser. No. 164,535

Int. Cl.[4] B25B *1/10*

U.S. Cl. 269—87.2 10 Claims

1. A holding device for an elongated workpiece comprising:

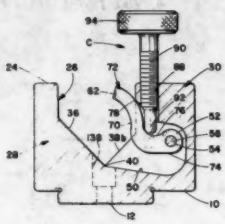
a body having a base portion including a mounting lug extending outwardly therefrom;

a first cavity formed in said body opening opposite said base portion, said first cavity including V-shaped support areas adapted to supportingly receive a variety of workpiece sizes;

a cavity extension portion contiguous with said first cavity and extending between said support areas;

a gripping member having a first end pivotally mounted in said cavity extension portion and a second gripping end, said gripping member having a reverse curved configuration including first and second oppositely facing concave surfaces, said first concave surface disposed adjacent sid second end and adapted for abutting gripping engagement with an associated workpiece supported by said support areas;

an adjustment stem threadedly mounted to said body in communication with said cavity extension for selective



movement relative thereto, said stem including a first end having a smooth curvilinear surface in cooperative engagement with said second concave surface for exerting a first rotational force on said gripping member;

biasing means exerting a second rotational force against said gripping means opposed to said first rotational force; and,

means adapted for guiding a cutting blade relative to a workpiece retained in said body, said guide means having a second cavity spaced from said first cavity.

4,796,878

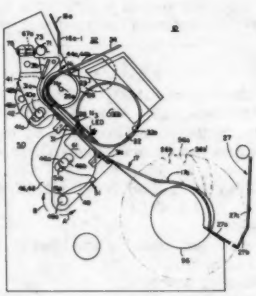
DOCUMENT HANDLING COUNTING APPARATUS

William Nicholson, Willow Grove; Gordon H. Groff, Bristol, and Paul C. Jones, Philadelphia, all of Pa., assignors to Brandt, Incorporated, Bensalem, Pa.

Continuation of Ser. No. 796,115, Nov. 8, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,742

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—10 6 Claims



1. Apparatus for handling and counting sheets comprising:

an input tray for receiving a stack of sheets, each having a nominal thickness;

a rotatable feed roller;

picker means for advancing the bottom sheet in a stack of sheets placed in the input stacker along a predetermined path toward said feed roller;

means for accelerating sheets;

the periphery of said feed roller having an annular groove;

stationary stripper means cooperating with the feed roller to form a feed nip for feeding single sheets delivered from

the input tray to said sheet acceleration means in a one-at-a-time fashion to facilitate examination of the sheets and for preventing the passage of double-fed sheets to said sheet acceleration means;

said stripper means comprising a stripper surface having a convex surface portion, extending toward the bottom of said annular groove for a distance to leave a gap between said groove bottom and said convex surface portion of less than said nominal thickness, an imaginary line passing through the point on said convex surface closest to said feed roller and the axis of rotation of said feed roller defining a pinch line, said pinch line forming an angle of between 15° plus or minus 5° with an imaginary vertical line passing through the axis of rotation of said feed roller to limit the passage of sheets beyond the feed nip to single sheets while preventing passage of double-fed sheets beyond the feed nip and at the same time the leading edges and surfaces of the sheets from being damage or abraded by said feed roller and stripper means;

a member having a curved surface covering a portion of the stripper means convex surface portion forward of the feed nip and having a surface with low coefficient of sliding friction as compared with said convex surface to reduce the friction experienced by sheets engaging said low friction surface and to reduce wearing of the stripper means and sheets being processed;

said curved member comprising a clip;

a mounting means for mounting the stripper means;

said clip retaining said stripper shoes on said mounting means;

said stripper means comprising first and second shoe members each having an opening;

said mounting means having an opening;

a pin extending through the openings in said mounting means and said shoe members, which are arranged on opposite sides of said mounting means;

said clip being resilient and having a C-shaped configuration having a central portion and integral sides embracing said stripper shoe member and holding the shoe members against said mounting means and holding said pin in said openings.

4,796,879

METHOD AND APPARATUS FOR STACKING SHEETS CONVEYED CONTINUOUSLY TO A STACKING POINT

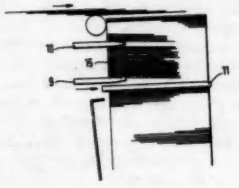
Norbert Martini, Erkrath, and Peter Naudascher, Hilden, both of Fed. Rep. of Germany, assignors to Jagenberg Aktienbesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,206

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544511; May 15, 1986, 3616470

Int. Cl.[4] B65H *31/32, 29/34*

U.S. Cl. 271—218 **1 Claim**



1. A method for intermittently removing stacked sheets from a continuously forming stack, comprising continuously supplying sheets to fall onto a stack formed on a platform (3) positioned therebelow forming a first gap (12) between the stack and a sheet to fall onto the stack, inserting a separating member (7) into said gap (12), whereby newly supplied sheets form an auxiliary stack above the separating member (7), lowering the stack and lowering the separating member more slowly than the stack thereby to enlarge the gap (12) to a larger gap (13), inserting a lower clamping jaw (9) into the larger gap (13), withdrawing the separating member (7) from the larger gap (13), forming a second gap (14) in the same manner as the larger gap (13), inserting an upper clamping jaw (10) into the second gap (14), clamping the sheets between the lower and upper clamping jaws (9,10), lowering the stack below the clamped jaws and lowering the clamped jaws more slowly so as to form a still larger gap (16) below the lower jaw (9), inserting a support (11) into said still larger gap (16), removing the platform (3) and sheets stacked thereon, positioning a new platform (3) below the support (11), withdrawing the support (11), raising the new platform (3') to just below the lower clamping jaw (9), removing the lower clamping jaw (9) and then the upper clamping jaw (10) whereby first the clamped sheets and then the sheets above the upper jaw (10) fall onto the new platform (3'), and repeating the cycle.

4,796,880

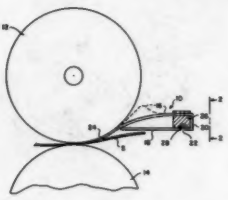
SKIVE WITH ANTI-GOUGE STIFFENER

Ernest J. Tamary, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,074

Int. Cl.[4] B65H *29/54*

U.S. Cl. 271—311 **4 Claims**



1. An apparatus having a soft roller and a skive for separating a sheet from the roller, the skive being generally U-shaped in configuration and having a flexible finger and a stiffener each connected at one end to a base, the finger and stiffener being spaced from each other and generally parallel to each other in an unflexed condition, the finger being longer than the stiffener, and means mounting the skive relative to the roller so that the end portion of the finger opposite from the base is flexed and contacts the roller to define therewith a small acute angle, and such end portion of the finger is in contact with the end of the stiffener opposite from the base, whereby the stiffener limits flexing of the finger and prevents its movement to a position wherein the end of the finger could gouge the roller.

4,796,881

MULTIPURPOSE EXERCISING APPARATUS

Scott R. Watterson, River Heights, Utah, assignor to Weslo, Inc., Logan, Utah

Filed May 8, 1986, Ser. No. 861,050

Int. Cl.[4] A63B *69/06*

U.S. Cl. 272—72 **17 Claims**

1. A multipurpose exercising apparatus usable in a plurality of orientations for the performance of exercises in each orientation comprising: main frame means having a head end and a front end; support means mechanically associated with said main frame means

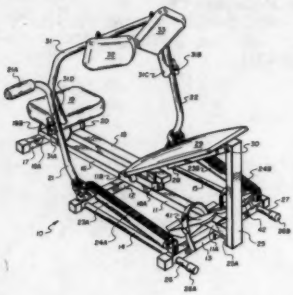
for supporting said main frame means in a horizontal orientation on a support surface for the performance of exercises in said horizontal orientation; track means mechanically associated with said main frame means; seat means slidably connected to said track means for supporting

a user seated thereon; at least one lever having distal and proximal ends and

mechanically associated with and rotatably mounted at its distal end to said main frame means for movement by a user positioned on said seat means; resistance means associated with said lever for surmountably resisting movement of said lever by the user; alternate frame means attached to said main frame means at one end thereof for supporting said main frame means on said support surface in a substantially upright orientation, said alternate frame means comprising:

a first alternate frame member angularly mounted adjacent to, and extending from, one end of said main frame means, said first alternate frame member having a free end, and

a second alternate frame member rotatably mounted to said first alternate frame member adjacent said free end for rotation about said free end through an arc from a first position in which said second alternate frame member is oriented toward said track means with said main frame means in said horizontal orientation for performance of selected exercises including exercises wherein the user operates the lever and to a second position in which said second alternate frame member is oriented away from said track means toward said support surface with said main frame means in said horizontal orientation for the performance of selected exercises and to a third position in which said second alternate frame member is oriented between said first and said second positions in alignment with said first alternate frame member with said main frame means in said substantially upright orientation for the performance of selected exercises including exercises wherein the user operates the lever;



user support means adaptable to both said first alternate frame member and said second alternate frame member, for providing support to a user's body in said first, second and third positions; and

foot bracing means mounted to said main frame means for bracing the user's feet.

4,796,882

PHYSICAL TRAINING APPARATUS

Fanchan J. Jiumr, 520, Chung-San Road, Shin-Woo Shiang, Taoyuan Prefecture, Taiwan

Filed Aug. 13, 1987, Ser. No. 87,854

Int. Cl.[4] A63B *69/06, 21/00*

U.S. Cl. 272—72 **6 Claims**

1. A new and multipracticable physical training apparatus comprising:

(a) a longitudinally extending angular frame defined by:

(i) a laterally extending rear support bar;

(ii) a longitudinally extending slide bar connected at its rear end to said rear support bar;

(iii) a laterally extending backward support bar, adapted for a pedaling exerciser and connected to the other end of said longitudinally extending slide bar;

(b) a stepped pedaling exerciser further including:

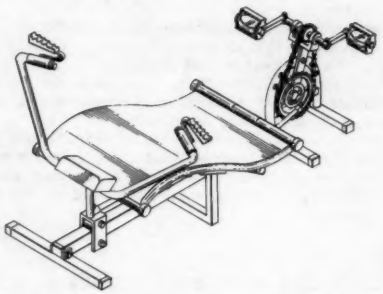
(i) an arched support bar having its backward end seated in said backward support bar and its forward end seated in a forward support bar, said arch support including a plurality of position regulating holes defined in its curved edge and extending between the forward and backward bottom support bars with a side support bar extending between the two ends of the arch support;

(ii) a directional regulating bar pivoted at its lower end in said side support bar and having an adjusting aperture alignable with said regulating position holes in said arch support at its mid portion, said regulating bar including a yoke defining left and right hand apertures for a hollow axle at its top;

(iii) a small ratchet wheel mounted on a hollow axle within said yoke;

(iv) a foot pedal attached to pedal axle extending laterally on each side of said arch support and pivotally engaging pedal cranks, in turn, pivotally supported on each end of said hollow axle;

(v) a big ratchet wheel rotatably positioned by means of a drive axle extending through the regulating bar bottom hole and a pivotal connector defined in the side support bar, chain means interconnecting the small ratchet wheel and the big ratchet wheel; and



(vi) a link bar pivotally connected at its forward end to said big ratchet wheel with its rear end extending towards the forward end of said frame;

(c) an arched massager apparatus further including:

(i) a U-shaped support frame positioned intermediate said rear support bar and said backward support bar and extending below said longitudinally extending side bar to which it is affixed and above both sides of said longitudinal support bar, said arched support bar further including:

(i) an arch support bar supported upon each upstanding end of said U-shaped support frame so as to support a massaging frame with a front low and rear high profile above said longitudinally extending support; and

(ii) a plurality of sets of rolling devices mounted upon axles extending laterally throughout said frame, such that rolling devices engage the back of an exerciser supported thereon;

(d) a forward sliding mechanism of inverted U-shaped configuration having an upper roller and a lower roller respectively engaging the top and bottom of said longitudinally extending slide bar, said forward sliding mechanism slidably positioned at the front end of said slide bar so as to be engagable pivotally with the rear end of said link bar of said stepped pedaling exerciser and including a vertically extending upper tube and a longitudinally extending flange tube;

(e) a backward sliding mechanism of inverted U-shaped

configuration having an upper roller and a lower roller respectively engaging the top and bottom of the rear of said longitudinally extending slide bar, including a vertically extending draw tube and one longitudinally extending flange tube, said draw tube supporting at its top an adjustable horizontally extending pivot link tube and supporting a rear portion of said massaging frame;

(f) a joint bar extending from the flange tube of the rear sliding mechanism to the flange tube of the forward sliding mechanism to maintain synchronous, sliding movement between said forward and backward sliding mechanism;

(g) a hand rowing exerciser in the form of a rowing handle bar positioned in said horizontally extending pivot link tube and extending outwardly of said device, said handle bar having a plurality of elastic rubber rings on its mid portion and supported within said pivot link tube;

(h) an arched handle positioned at each handlebar end and further including:

(i) a compression spring, and

(ii) a hand gripping tube rotatably supported at the outer ends of said handle bar, such that said hand gripping tube pivots upon said handle bar;

(i) an elastomeric seat mat having a soft clothing cover supported upon said massaging frame and including:

(i) covering tubes which engage the forward and rear portions of the frame; and

(ii) a pillow connected to the back of said mat and extending between the covering tubes mounted upon the rear portion of the frame.

4,796,883

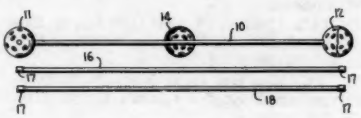
METHOD AND APPARATUS FOR JUGGLING

Harvey Ratner, 2905 Red Lion Lane, Silver Spring, Md. 20914

Filed Dec. 11, 1986, Ser. No. 940,415

Int. Cl.[4] A63B *67/00*; A61B *3/00*

U.S. Cl. 272—93 **9 Claims**



1. A twirlable amusement device for use in ocular exercise and training and for hand-eye coordination exercise and training, said device comprising:

an elongated rod of material having a smooth exterior surface with a low coefficient of friction, said rod having first and second ends and an intermediate portion disposed between said first and second ends;

first and second end members with exterior surfaces of first and second different colors, respectively, removably secured to said first and second ends, respectively, each end member having a transverse dimension at least twice as large as the transverse dimension of said rod, wherein the exterior surfaces of said first and second end members intersect the exterior surface of said rod at first and second visible junctions, respectively;

means for selectively varying the center of gravity of said rod, said means comprising a slide member slidably disposed on the smooth exterior surface of said rod to frictionally engage said intermediate portion of said rod at multiple selectible positions along the rod, said slide member having a transverse dimension at least twice as large as the transverse dimension of said rod and having an exterior surface of a third color different from said first and second colors, the exterior surface of said slide member intersecting the exterior surface of said rod at third and fourth visible junctions that are movable along said intermediate portion of the rod with said slide member; and

first and second catcher/tosser means adapted to be held in first and second hands, respectively, of a user of the device to permit said rod to be engaged between said first and second catcher/tosser means alternatively at said first, second, third and fourth junctions, wherein said first and second catcher/tosser means comprise respective first and second elongated wands each having a smooth outer surface of relatively low coefficient of friction such that the smooth outer surface of said rod slides smoothly and easily along the smooth outer surfaces of said wands when the rod is engaged between the wands.

4,796,884

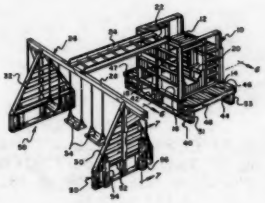
CHILD'S PLAY SET WITH A LIFT SYSTEM

Donald B. Ely; Dale A. Ely, both of Richwood, and Eric W. Anderson, Franklinville, all of N.J., assignors to Loop Design, Inc., Richwood, N.J.

Filed Feb. 10, 1987, Ser. No. 13,235

Int. Cl.[4] A63B *17/00*

U.S. Cl. 272—113 **19 Claims**



1. A play set comprising:

(a) a box-like structure with four walls each having a base wood member that together form a foot print that can rest on the ground wherein the box-like structure has no floor attached to it and no cross members spanning between the base members, wherein the height of the box-like structure is suitable for small children, and

(b) a lift system comprising:

(i) four vertically positioned rectangular frame structures of a height chosen to raise the box-like structure a sufficient distance to provide a total interior height suitable for larger size children, and

(ii) attachment means to fix the four vertically positioned rectangular frame structures into a four sided horizontal frame of a size to match the footprint of the base wood members of the box-like structure,

wherein there are no cross members spanning the horizontal frame.

4,796,885

INSERT FOR BATTING TEE AND METHOD OF REPAIRING A BATTING TEE

Robert L. Wright, 4221 75th St., Des Moines, Iowa 50322

Filed Jun. 16, 1986, Ser. No. 874,508

Int. Cl.[4] A63B *69/40*

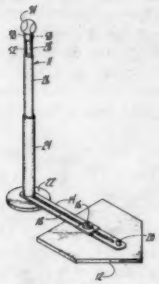
U.S. Cl. 273—26 R **3 Claims**

1. A batting tee comprising,

an upstanding post having a hollow upper post section adapted to hold a ball on the upper end thereof, and

an insert unit including a substantially solid plug positioned in the hollow upper end of said upper post section to strengthen and rigidify said post against damage from

impact from ball bats striking balls held by the upper end of said upper post section, and



said insert unit including at its upper end a sleeve extending downwardly and outwardly around the outer end of said upper post section.

4,796,886

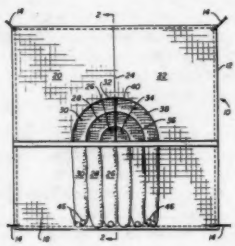
HOME TENNIS PRACTICE APPARATUS

George A. Loh, 1344 Tarpon St., Foster City, Calif. 94404

Filed Jul. 7, 1986, Ser. No. 882,952

Int. Cl.[4] A63B *69/38*

U.S. Cl. 273—29 A **4 Claims**



1. A tennis practice apparatus, which comprises a supporting surface, said supporting surface being divided into a lower portion corresponding in height to a regulation tennis net and at least one court portion above said tennis net portion, means for positioning said supporting surface in a substantially vertical position, at least first and second target pockets positioned in said at least one count portion of said supporting surface, said at least first and second target pockets each having an opening at said supporting surface, said at least first and second target pockets being dimensioned and configured to receive a tennis ball directed at one of the openings, said first target pocket having its opening of a first area and being positioned immediately above said tennis net portion, said second target pocket having its opening of a second area greater than the first area, at least part of the second area being spaced from said tennis net portion by the first area, said supporting surface including at least a second court portion above said tennis net portion and beside said at least one court portion, and at least third and fourth target pockets in said second court portion corresponding to said first and second target pockets.

4,796,887

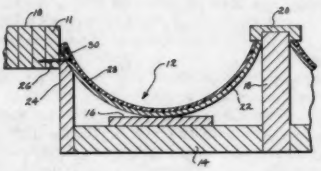
BOWLING LANE GUTTER

David A. Sternhagen, Green Bay, Wis., assignor to D & H Bowling Supply, Inc., DePere, Wis.

Filed Jul. 14, 1986, Ser. No. 885,238

Int. Cl.[4] A63D *1/04*

U.S. Cl. 273—51 **14 Claims**



1. A gutter structure for a bowling lane comprising:

an elongated gutter substrate positioned adjacent a side of the bowling lane, said substrate having a generally concave configuration suitable for receiving a bowling ball, said substrate having an upwardly exposed surface; and

a single sheet of polyethylene material applied to said upwardly exposed surface of said substrate and running the length of said elongated gutter substrate, said single sheet covering the gutter substrate; and

a plurality of fastener means along one edge of the gutter substrate and sheet, said fastener means being spaced in the direction of elongation of said gutter substrate and recessed below the surface of said sheet of polyethylene material.

4,796,888

HUE SEQUENCE DEVICE

Nigel Louez, 111 Belmont Road, Mosman, New South Wales 2088, Australia

PCT No. PCT/AU85/00254, § 371 Date Jun. 17, 1986, § 102(e) Date Jun. 17, 1986, PCT Pub. No. WO86/02569, PCT Pub. Date May 9, 1986

PCT Filed Oct. 23, 1985, Ser. No. 885,609

Claims priority, application Australia, Oct. 23, 1984, PG7780; Nov. 26, 1984, PG8288

Int. Cl.[4] A63B *41/00, 41/08;* A63H *33/04*

U.S. Cl. 273—58 R **22 Claims**

1. A novelty item capable of producing variable axis colour mixing, said novelty item comprising: a sphere, spheroid or polyhedron capable of spinning freely and randomly upon many axes of spin when spun on a generally planar surface, the whole exterior surface of said sphere, spheroid or polyhedron being divided into a plurality of generally equally sized and generally equally shaped coloured areas, said axes including both neutral and non-neutral axes, a neutral axis being an axis passing through the center of said sphere, spheroid or polyhedron and through a point on the surface of said sphere, spheroid or polyhedron which is a function point of a triadic colour combination, a triadic colour combination being a set of three of said coloured areas having colours selected from points located at equal spacings around a 2D colour wheel; said coloured areas being coloured according to a 2D to 3D colour mapping scheme wherein no two adjacent one of said coloured areas are of the same colour and the colour of each one of said

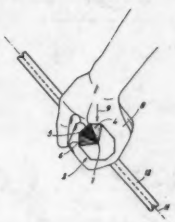
coloured areas is selected such that any two of said coloured areas which are respectively coloured with colours which are at a maximum distance from each other on the 2D colour wheel with respect to any other colour on the 2D colour wheel are also at a maximum distance, measured across the exterior surface of said sphere, spheroid or polyhedron, from each other with respect to any other of said coloured areas on said sphere, spheroid or polyhedron; said mapping scheme providing an inherent infinite plurality of non-neutral and an inherent finite plurality of neutral axes of spin of said sphere, spheroid or polyhedron; whereby when said sphere, spheroid or polyhedron is randomly spun on any one of said infinite plurality of non-neutral axes a clean mix of colours near the poles and a strobing effect of colours at the equator is presented to an observer, the detailed colour composition of which varies as the axis of spin varies; said sphere, spheroid or polyhedron when randomly spun on one of said finite number of neutral axes presenting to an observer an overall even, neutral tone; said sphere, spheroid or polyhedron spinning on a planar surface continually and randomly varying its axis of spin so that said sphere, spheroid or polyhedron spins successively upon a multiplicity of the infinite plurality of non-neutral axes interspersed with the occasional spin on ones of said finite number of neutral axes.

4,796,889

TIP FOR TENNIS RACKET HANDLE AND THE LIKE, AND RACKET EQUIPPED WITH THIS TIP

Renaud Mursaour, 57 avenue de Saint-Paul, Montelimar, Drome, France

Filed Dec. 15, 1987, Ser. No. 133,725
Claims priority, application France, Dec. 19, 1986, 86 18456; European Pat. Off., Nov. 2, 1987, 87420300.3
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 J **10 Claims**



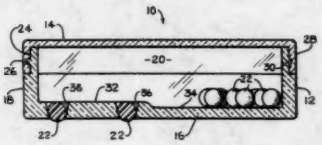
1. A tip for a free end of a racket handle comprising:
a flat element having an octagonal perimeter corresponding to the perimeter of the cross section of the free end of the racket handle;
said element comprising at least two adjacent differentiated triangular sectors;
said triangular sectors having one vertex which coincides with the longitudinal axis of said handle;
the side of said triangular sectors opposite this vertex comprising one of the adjacent sides of said octagonal perimeter;
said element being adapted and constructed to be fastened to said free end of said handle in such position whereby the differentiation of the triangular sectors permits correct angular positioning of said handle relative to a precise point of the hand of the user of the racket.

4,796,890

RANDOM NUMBER SELECTION DEVICE

Blair G. Snyder, 1405 N. 36th St., No. 2, St. Joseph, Mo. 64506

Filed Mar. 6, 1987, Ser. No. 23,002
Int. Cl.[4] A63F *7/04*
U.S. Cl. 273—144 B **4 Claims**



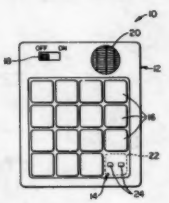
1. A random indicia selection device comprising:
a container having a generally transparent top wall, a bottom wall, and enclosing side walls, said walls defining a ball-receiving compartment; and
a plurality of equal-sized balls received within said compartment, each of said balls bearing a respective, distinct indicium thereon,
said bottom wall including a plurality of equal-sized, ball-receiving cavities defined therein, the number of cavities being less than the number of said balls, said balls being respectively registrable within said balls, those of said balls registered in said cavities and respective indicia being viewable through said top wall, said indicia so viewed representing a random set of indicia, said cavities being arranged in a plurality of rows, each of said rows having at least one of said cavities, the number of said cavities in a given one of said rows being different than the number of said cavities in any other one of said rows.

4,796,891

MUSICAL PUZZLE USING SLIDING TILES

Ronald E. Milner, Grass Valley, Calif., assignor to Applied Design Laboratories, Inc., Grass Valley, Calif.

Filed Feb. 2, 1987, Ser. No. 9,961
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S **18 Claims**



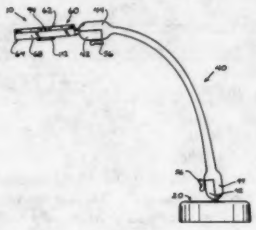
1. A puzzle, comprising:
a rectangular array of title members enclosed in a frame structure, each of the title members having an electrical property;
tone-generating means housed in the frame structure; and
means for selectively placing the electrical property of one or more of the title members in circuit with the tone-generating means to produce a sound having a characteristic determined by the electrical property carried by the title member that identifies such tile member and distinguishes it from other of the tile members.

4,796,892

GOLF TRAINING AND PRACTICE DEVICE

Leonard G. Doerrfeld, 317 Pheasant Trail, Lake In The Hills, Ill. 60102

Filed Jun. 29, 1987, Ser. No. 67,005
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—183 E 18 Claims



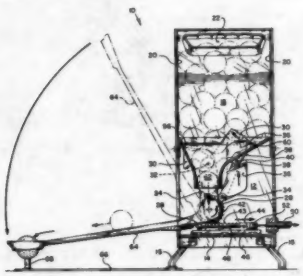
1. A golf training and practice device for use by a golfer and a golf training instructor wherein said device includes:
a. a base having a weight means secured thereto for stability;
b. an arcuate arm extending in an upward curve from said base and movably attached to said base at a first end of said arm;
c. a sighting-aiming member movably attached to said arm at a second end of said arm, said second end being oppositely disposed from said first end;
d. said sighting-aiming member has an oval-shaped sighting aperture capable of providing a binocular view of a golf ball;
e. said sighting-aiming member includes an upper part and a lower part;
f. said upper part has a swing-path line on a longest portion thereof;
g. said lower part has a club-alignment line on a breadth of said lower part; and
h. said upper part includes a mating section to secure said upper part to said lower part.

4,796,893

PORTABLE GOLFBALL TEEING DEVICE

Young S. Choi, 3434 El Camino Real, Santa Clara, Calif. 95051

Filed Aug. 3, 1987, Ser. No. 57,215
Int. Cl.[4] A63B 57/00
U.S. Cl. 273—201 6 Claims



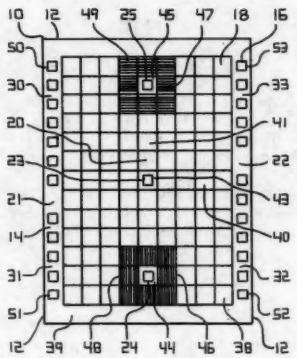
1. A device for separating spherical objects comprising:
(a) an upstanding hopper means for holding a plurality of spherical objects;
(b) platform means having large and small openings, said openings being joined by an inclined wall to form a funnel shape, said large opening being attached to the lower end of said hopper and said small opening extending downward therefrom, said wall having a plurality of elongated slots therein to move only in single file through said small opening;
(c) blade means, including a pair of parallel blades that travel in an arcuate path through a corresponding pair of elongated slots in said wall and a third blade that reciprocates vertically through a third slot in said wall said blade means cooperating to rotate said spherical objects downward in single file toward said small opening; and
(d) rotatable cup means below said opening to singly receive said object through said opening and to deliver said object in response to actuation; and
(e) pedal means interconnected to said cup means whereby pressing of said pedal means simultaneously actuates or rotates said cup means to deliver a spherical object while simultaneously causing said blade means to rotate spherical objects toward the opening.

4,796,894

BOARD GAME APPARATUS AND METHOD

Donald G. Smith, 507 Tufts Ave., Burbank, Calif. 91504

Filed Jul. 6, 1987, Ser. No. 69,838
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—244 7 Claims



1. A game apparatus consisting of:
a board having a plurality of sides and a surface with holes and spaces,
said holes forming a plurality of vertical columns consisting of only one inner-column and a plurality of outer-columns, said inner-column having only one inner-hole and a plurality of outer-holes, each of said outer-columns having a plurality of groups of holes,
said spaces forming a grid of horizontal, vertical and diagonal rows, said grid having only one mid-horizontal and only one mid-vertical row, said mid-vertical and said horizontal rows intersect at a center space,
said grid being separated from said sides of said board by a continuous margin,
said columns of holes being superimposed over said surface of said board in such a way that said inner-column occupies said mid-vertical row and said outer-columns occupy said margin, said inner-hole occupies said center space, each of said outer-holes occupies a space equal distance from said center space,
a plurality of goal-spaces, each of said goal spaces being occupied by an outer-hole,
a plurality of goal-areas, each of said goal areas including each of said spaces adjacent one of said goal spaces,
a plurality of pieces each designed to occupy one of the

spaces, a plurality of pegs designed to fit in the holes on the surface, and

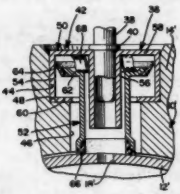
a plurality of cubes, each of said cubes having a plurality of faces each of said faces of each of said cubes having only one symbol thereon, a plurality of said faces of each cube having a symbol the same as another symbol on a face of said cube, a plurality of said faces of each cube having a symbol differing from said symbols on said other faces of said cube.

4,796,895

SELF ADJUSTING SEAL FOR HIGH PRESSURE SUPPLY LINE

Robert L. Perkins, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 25, 1988, Ser. No. 148,297
Int. Cl.[4] F16J *15/00, 15/32*
U.S. Cl. 277—4 2 Claims



1. A self adjusting seal assembly for use with a pipe that supplies a high pressure fluid through an inlet in a housing, said housing inlet including a generally cylindrical side wall, a generally planar bottom wall, and a central port through said bottom wall, said seal assembly comprising,

a generally cylindrical outer sleeve having a generally annular top wall axially spaced from said inlet bottom wall and through which said pipe is centrally received, said outer sleeve also having an outer wall joined continuously to the periphery of said annular top wall and sized so that the outer surface thereof tightly fits within said inlet cylindrical wall to retain said outer sleeve in said inlet,

a generally cylindrical inner sleeve located within and radially inwardly spaced from said outer sleeve and radially outwardly spaced from said pipe, said inner sleeve having a generally radially extending upper end surface axially spaced from said outer sleeve top wall and a lower edge located proximate said inlet bottom wall,

a lip seal on said inner sleeve upper end surface wipingly engaged with the inside of said outer sleeve outer wall,

a compression seal on said inner sleeve lower edge compressible against said inlet bottom wall in surrounding relation to said port, and,

resilient means engageable between said outer sleeve top wall and said inner sleeve to bias said compression seal against said inlet bottom wall,

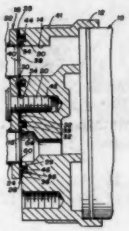
whereby, before high pressure fluid leaves said pipe, said compression seal will be maintained compressed against said inlet bottom wall regardless of tolerance variations in the spacing between said outer sleeve top wall and said inlet bottom wall, and when high pressure fluid does leave said pipe, it will, by, virtue of being blocked by said lip seal, pressurize the space between said outer sleeve top wall and said inner sleeve upper end surface and force said compression seal more strongly against said inlet bottom wall.

4,796,896

MULTI-STAGE ELASTOMERIC SEAL WITH RETAINER

Russell C. Anderson, Jr., N. Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1988, Ser. No. 156,344
Int. Cl.[4] B65D *53/00*
U.S. Cl. 277—181 3 Claims



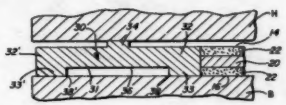
1. A two-stage elastomeric seal for sealing a passage extending through two parts that form a joint, said seal comprising a rigid retainer having a first annular section adapted to extend about said passage and be directly contacted and clamped by said joint parts thereby to be retained and effect a predetermined space between said joint parts, said rigid retainer further having a second annular section integral with and extending radially inward and axially of said first annular section and adapted to extend into an annular groove in one of said joint parts, an annular elastomeric seal body sandwiching and bonded to said second annular section, said seal body having an annular primary seal section adapted to extend about said passage and be received in said annular groove and be directly contacted and squeezed by the bottom of said groove and an annular surface on the other of said joint parts, said seal body further having an annular secondary seal section adapted to extend about said passage and be directly contacted and squeezed by said joint parts, and said primary seal section having a cross section with a thickness substantially greater than that of said secondary seal section thereby to effect substantially higher compression of said secondary seal section than of said primary seal section on squeezing of said seal body by said joint parts.

4,796,897

HEAD GASKET WITH BEAM-FUNCTIONING FIRE RING

Josefino T. Incioog, Skokie, Ill., assignor to Fel-Pro Incorporated, Skokie, Ill.

Filed Aug. 28, 1987, Ser. No. 90,843
Int. Cl.[4] F16J *15/06*
U.S. Cl. 277—211 12 Claims



1. A gasket assembly comprising an expansive main gasket body having upper and lower main surfaces adapted to be disposed between the head and block of an internal combustion engine, and defining a plurality of openings, including at least one combustion opening, fluid openings and bolt holes, and an annular beam functioning fire ring positioned and disposed in each combustion opening,

said beam functioning fire ring comprising, in radial cross-section, an annular beam, an annular bead projecting from the beam in a first vertical direction and annular support

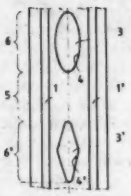
feet projecting from the beam in the opposite vertical direction, said feet straddling and defining an annular recess therebetween, said bead being disposed above said recess and between said feet and being offset radially inwardly of said recess from the vertical projection of each foot by a distance equal to at least one half of the radial width of said bead.

4,796,898

OIL SCRAPER PISTON RING WITH ELLIPTICAL OIL VENT HOLES

Bert Brauers, and Martin Morsbach, both of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 30,321
Int. Cl.[4] F16J 9/12, 9/22
U.S. Cl. 277—216 4 Claims



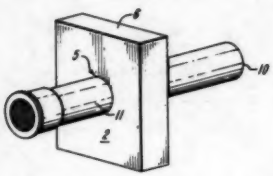
1. An oil scraping piston ring for use within a cylinder of an internal combustion engine, the cylinder having an inner wall, comprising at least one web for lying against the inner wall of the cylinder, said at least one web having an external circumferential face for facing the wall, a circumferential groove in said face, and elliptically shaped radial oil vent holes opening into said groove.

4,796,899

LIQUID-TIGHT SEALING DEVICE AND METHOD

Robert S. Herrick, 1065 South East St. Lucie Blvd., Stuart, Fla. 33494, and Gary E. Webb, 501 Southeast Capon Ter., Port St. Lucie, Fla. 33452

Filed Feb. 2, 1987, Ser. No. 10,267
Int. Cl.[4] F16J 15/10
U.S. Cl. 277—228 9 Claims



1. A device for providing a liquid-tight seal between a hollow structure and a cured casting comprising:

a. a hollow structure; and

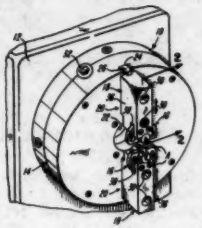
b. a foamed polymeric sealing element adhesively bonded to and extending completely about an exterior surface of said structure along a portion of the length thereof, and extending outwardly from said exterior surface.

4,796,900

WORKPIECE HOLDING ASSEMBLY FOR A CHUCK

Eugene Gant, 4605 Merrydale Ave., Dayton, Ohio 45431, and Richard Spangler, 3924 Cloverdale Rd., Medway, Ohio 45341

Filed Mar. 3, 1988, Ser. No. 163,779
Int. Cl.[4] B23B 31/16
U.S. Cl. 279—123 19 Claims



1. An adjustable workpiece holder for use on a chuck jaw, comprising:

(a) a base portion adapted to extend into a groove defined in an end of the chuck jaw, said base portion having an arcuate shaped slot defined therethrough adapted to receive at least one fastener therethrough for releasably clamping said base portion in the chuck jaw end groove; and

(b) opposing shaft portions attached to and projecting in opposite directions from said base portion and adapted to rotatably seat in recesses formed in the chuck jaw end on opposite sides of the groove therein when said base portion extends into the groove;

(c) said shaft portions and said base portion slot having a common central axis and a workpiece engaging notch defined therein extending generally parallel to the common central axis thereof;

(d) said base portion being movable in the chuck jaw end groove and said shaft portions being rotatable in the chuck jaw end recesses for adjusting the angular position of said shaft and base portions and thereby of said notch relative to the chuck jaw end before clamping of said base portion in the chuck jaw end groove.

4,796,901

SADDLE-SEATED VEHICLES

Takemitsu Furukawa, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

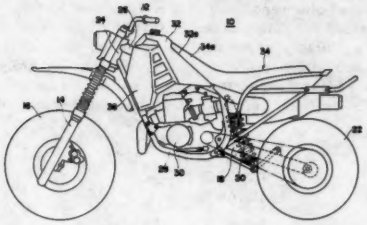
Filed Mar. 2, 1987, Ser. No. 21,038
Claims priority, application Japan, Mar. 3, 1986, 61-30288[U]
Int. Cl.[4] B62K 11/04
U.S. Cl. 280—5 A 6 Claims

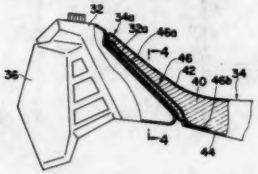
1. A saddle-seated vehicle including a fuel tank having a rear upper face, and a seat located in the rear of said fuel tank, wherein:

said fuel tank includes on the rear upper face a recess receiving the front portion of said seat,

said seat is formed of a cushion material and has a front portion extending over the rear upper face of said fuel tank and in resilient contact with said rear upper face in said recess, and

a resilient member contained in the cushion material forming said front portion and resiliently biasing said front portion





of said seat into engagement with said rear upper face of said fuel tank in said recess.

4,796,902

STEERABLE SLED EQUIPPED WITH RUNNER MEANS

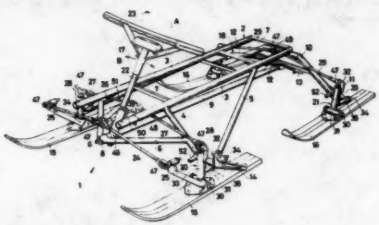
Silvano Capra, Carzano, Italy, assignor to Manghen S.r.l., Parma, Italy

Filed Jun. 12, 1987, Ser. No. 61,286

Claims priority, application Italy, Jun. 19, 1986, 59013/86[U]; Mar. 6, 1987, 21050/87[U]

Int. Cl.[4] B62B *13/08*

U.S. Cl. 280—16 **18 Claims**



1. A steerable sled, comprising: a front chassis connected to a rear chassis through a suspension system and a directional control system, and a pair of sled runner members connected to at least one of the chassis through said directional control system, the directional control system comprising a steering wheel coupled to a rotable and laterally displaceable steering column, a pair of hinge linkages, each hinge linkage being connected to a corresponding one of the sled runner members and defining at least two mutually perpendicular rotational axes, one of which axes is a horizontal rotational axis, and sled runner actuation means including a sled runner actuation rod extending generally parallel to the longitudinal axis and interconnecting the front chassis, steering column and rear chassis for transmitting directional input from the steering column to the sled runnner members about the horizontal rotational axis through the hinge linkages, said sled runner actuation rod being coupled to said rear chassis by means for effecting axial and rotational displacement of said rear chassis relative to said front chassis.

4,796,903

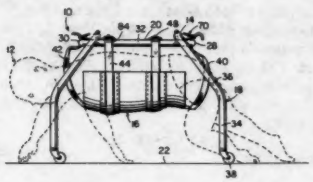
CREEPER FOR HANDICAPPED CHILDREN

David C. Proctor, P.O. Box 5202, Abilene, Tex. 79604, and James M. Proctor, P.O. Box 3313, Abilene, Tex. 79608

Filed Oct. 22, 1986, Ser. No. 921,448

Int. Cl.[4] B60P *3/00*

U.S. Cl. 280—87.02 W **19 Claims**



1. In a crawl training device having a wheeled frame, a body support, flexible means for suspending the body support and a relatively rigid panel secured to the frame having a peripheral portion and opposite longitudinal ends, the improvement comprising means mounted above the body support for anchoring the flexible means directly to the panel and guide means on the panel engageable by the flexible means to prevent longitudinal and inward movement thereof for positioning the suspended body support below and in alignment with the panel, said flexible means including longitudinally spaced body holding straps extending laterally from the body support in encircling relation to the panel between said ends thereof, said guide means including a plurality of formations on the peripheral portion of the panel receiving the holding straps therein while enabling removal thereof by outward movement relative to the panel.

4,796,904

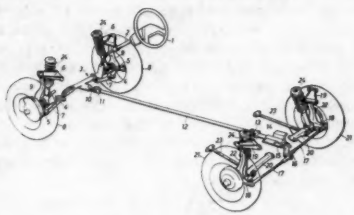
REAR WHEEL STEERING DEVICE FOR FRONT AND REAR WHEEL STEERING SYSTEM

Kanji Kubo, and Kenichi Ohno, both of Wako, Japan, assignors to Honda Giken Kogyo Kabuchiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,583

Int. Cl.[4] B62D *7/00*

U.S. Cl. 280—91 **3 Claims**



1. A rear wheel steering device for a front and rear wheel steering system of a wheeled vehicle wherein rear wheels are steered by displacement of tie rods connected to knuckles of the rear wheels and disposed in the lateral direction of the vehicle in an opposite phase relationship relative to the front wheels at least under a certain condition, characterized in that:

a pair of imaginery lines formed by connecting pivot points between the knuckle arms and the tie rods to corresponding points of intersection between a horizontal plane con-

taining the said pivot points and center lines of rotation of the knuckles, as they are steered, relative to a body of the vehicle intersect at a point which is located ahead of a center line of the rear wheel axle, wherein said pivot points between the knuckle arms and the tie rods are located behind the points of intersection between the horizontal plane containing said pivot points and the center lines of rotation of the knuckles relative to the vehicle body.

4,796,905

SPRAY-SUPPRESSANT SURFACE CONFIGURATION

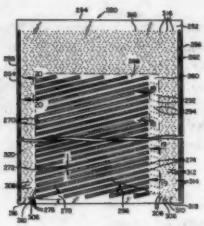
Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 794,306, Nov. 1, 1985, which is a continuation-in-part of Ser. No. 732,439, May 9, 1985, abandoned. This application Oct. 31, 1986, Ser. No. 926,142

Claims priority, application United Kingdom, May 3, 1985, 8511307; Dec. 14, 1985, 8530858; European Pat. Off., May 2, 1986, 86303379.1

Int. Cl.[4] B62D *25/16*

U.S. Cl. 280—154.5 R **18 Claims**



1. A spray-suppressant flap for use behind the wheels of a highway vehicle for limiting the amount of spray thrown into the air by operation of such a vehicle on a wet roadway, comprising:

(a) an imperforate base member defining a generally planar base surface limited by a top and a bottom, a laterally inner marginal portion and a laterally outer marginal portion, said marginal portions extending vertically and defining a width of said flap;

(b) a plurality of substantially parallel and straight bars located only on a first area of said base surface, each of said bars projecting fowardly and sloping downwardly from said base member and extending along said base member slopingly from an upper end located nearer said laterally inner marginal portion toward a lower end located nearer said laterally outer marginal portion; and

(c) a plurality of spray-suppressant members projecting forwardly from said base surface in a second area of said base surface located adjacent said first area thereof, said spray-suppressant members in said second area defining a plurality of generally vertical channels, and the portions of said base surface within said channels and between said bars in said first area being free from said spray-suppressant members.

4,796,906

SPRAY-SUPPRESSANT SURFACE CONFIGURATION

Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 732,439, May 9, 1985, abandoned. This application Nov. 1, 1985, Ser. No. 794,306

Claims priority, application United Kingdom, May 3, 1985, 8511307

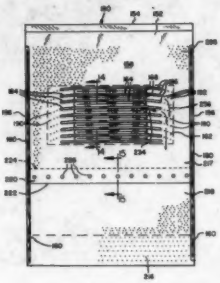
Int. Cl.[4] B62D *25/16*

U.S. Cl. 280—154.5 R **18 Claims**

1. A spray-suppressant flap for use behind the wheels of a highway vehicle for limiting the amount of spray thrown into the air by operation of such a vehicle on a wet roadway, comprising:

(a) an imperforate base member of a resilient, elastomeric material, defining a planar base surface limited by a top and a bottom and a pair of lateral marginal portions which extend vertically and define a width of said flap;

(b) a plurality of substantially parallel, vertically apart-spaced laterally-extending bars projecting forwardly from said planar base surface only in a first area located laterally centrally and extending above mid-height of said



planar base surface, each of said bars having a thickness and a forwardly-projecting width at least about twice as great as said thickness; and

(c) a plurality of spray-suppressing members projecting forwardly from said planar base surface in a second area of said planar base surface located adjacent said first area thereof, said spray-suppressing members in said second area defining generally vertical channels extending along said planar base surface between said spray-suppressing members, with said planar base surface within said channels being free from said spray-suppressing members.

4,796,907

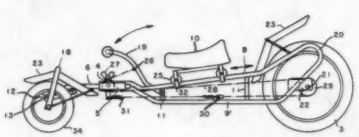
MUSCLE-POWER-DRIVEN VEHICLE

Herbert Geller, Maxburgstrasse 8, D-6701 Altrip, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,522

Int. Cl.[4] B62M *1/14*

U.S. Cl. 280—220 **14 Claims**



1. A muscle-power-driven vehicle comprising chassis with a frame and two front wheels at one end, footoperable means to guide the vehicle, a front axle, yoke, at least one drivable rear wheel having an axle, a seat, a lever which is pivoted on the chassis, a toothed rim, which is free-wheeling in one direction, surrounding the drivable rear wheel axle, chain-drive means for at least one rear wheel, said chain-drive means engaging the free-wheeling toothed rim and having two ends, one of which is attached to the lever and the other of which is connected, via a recovery spring, to the chassis, and guiding roller means around which the chain-drive means traverses at a position intermediate the end attached to the lever and said free-wheeling toothed rim;

the frame comprising two one-piece pipe segments which are substantially alike and parallelly disposed, between

which is positioned the rear wheel and the guiding roller means, which are joined together by spacing members,

the two one-piece pipe segments comprising upper struts and lower struts, the upper struts being in the form of rails which support rollers on which the seat is mounted.

4,796,908

SKI BINDING

Vladimir S. Makarenko, prospekt Kultury, 11,korpus 1, kv. 279, Leningrad, U.S.S.R.

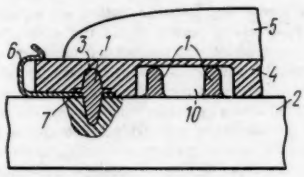
PCT No. PCT/SU86/00034, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06291, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 18, 1986, Ser. No. 44,366

Claims priority, application U.S.S.R., Apr. 26, 1985, 3880000

Int. Cl.[4] A63C *9/10*

U.S. Cl. 280—615 **4 Claims**



1. A ski binding comprising:

a plurality of rest pins disposed on one of a ski and the bottom surface of a ski boot along a longitudinal axis thereof, said rest pins having substantially the same shape;

a plurality of holes for mating with said rest pins, disposed on the other of said ski and ski boot along the longitudinal axis thereof, such that any of said pins can be selectively fitted within selected ones if said holes for varying the location of the ski boot relative to the ski along the longitudinal axis thereof, thereby restraining said boot on said ski in a manner dependent on the type of skiing to be performed; and

lock means for locking the forwardmost one of said pins and said holes being disposed on the ski boot to a selected one of said pins and said holes disposed on the ski.

4,796,909

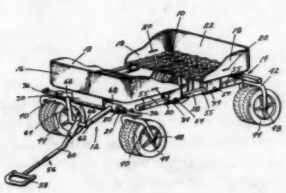
LOW-BED SERVICE CART

Vern S. Kirkendall, 783 Portal Dr., Chico, Calif. 95926

Filed Feb. 8, 1988, Ser. No. 153,845

Int. Cl.[4] B62B *3/02*

U.S. Cl. 280—651 **8 Claims**



1. A four wheeled, low bed service cart with adjustable bed comprising

a. a bed portion having two substantially rectangular platforms horizontally positioned with broad surfaces upwardly and downwardly and a longer straight edge of one of said platforms aligned with a longer straight edge of the other of said platforms, the opposite outside longer edges of both said platforms rounded cornerwise at emergence with shorter edges, said platforms being separably attached to each other by an adjustable supporting means, said platforms affixed upwardly along said outside longer edges with vertical solid walled low-profile end rails extending in uniform height to said curved merging corners, then curving downwardly along said shorter edges from a higher position to a lower side position forming side rails with said side rails apertured for strap attachment, said two platforms fabricated of expanded material producing minute rectangular openings through said broad surfaces being flooring for said bed portion of said service cart;

b. a frame portion being said adjustable supporting means for said platforms with said frame portion comprising two horizontally disposed U-shaped rods having a straight rod affixed across the opened end of said U with said U-shaped rods affixed as supportive edging to said downwardly faced broad surfaces of said platforms, said U-shaped rods and said platforms affixed downwardly on each side to a support hanger transversely shafted and slidably encasing an adjustable bed support bar, said bed support bar being a horizontally inclined squared tubing, said bed support bar aligned with adjustment apertures and retained in position in said encasing by a slide adjustment retainer means fitting said apertures in said bed support bar and a single aperture in said support hanger providing adjustment means for increasing and decreasing separation between said separably attached platforms;

c. a front wheel assemblage aligned crosswise relative to said frame portion and affixed downwardly adjustably to a first extreme end of said bed portion with that particular end being the front end of said cart, said front wheel assemblage attached to said bed portion by a support hanger transversely shafted for centrally encasing a removable front wheel support bar, said front wheel support bar being a hollow rectangular tube sized to accept end insertion of wheel support insert rods, there being means for removably retaining said wheel support insert rods with end fixtures attached oppositely, the inserted end downwardly in a use position or upwardly in a storage position, said end fixtures of said wheel support insert rods having endwardly mounted removable swivel brackets housing balloon tire wheels attached by axles therein, said brackets and wheels positioned individually swiveling one at each end of said front wheel assemblage, there being removably attached hingedly to said front wheel support bar a frontwardly extending telescoping tow handle arm affixed with a rounded and cross membered handle grip at the free end thereof;

d. a rear wheel assemblage aligned crosswise relative to said frame portion and affixed downwardly adjustably to a second extreme end of said bed portion with that particular end being the rear end of said cart, said rear wheel assemblage attached to said bed portion at said rear end of said cart by a support hanger transversely shafted to house a removable rear wheel support bar, said rear wheel support bar being a hollow rectangular tube sized to accept end insertion of wheel support insert rods, there being means for removably retaining said wheel support insert rods with end fixtures attached oppositely, the inserted end downwardly in a use position or upwardly in a storage position, said end fixtures on said wheel support insert rods having endwardly mounted removable brackets housing balloon tire wheels attached by axles therein, said brackets and wheels positioned one at each end of said rear wheel assemblage;

e. a load securing means comprising two elongated straps removably fastened to said cart attached through said side rail apertures with said straps having adjustable attachment means for temporarily fixing free ends thereof one to the other;

f. an accessory storage means in the form of a rectangular fabric pouch compartmented to house folded beach chairs and lesser items and having straps sized for retaining the

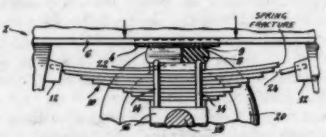
maximum cargo applicable to said cart, there being means for adjustably attaching the free ends of said straps one to the other.

4,796,910

AUXILIARY SUSPENSION SYSTEM FOR A MOTOR VEHICLE

Urban Starr, Sr., Upper Main St., North Troy, Vt. 05859

Filed Oct. 31, 1984, Ser. No. 666,828
Int. Cl.[4] B60G *11/40*
U.S. Cl. 280—715 **12 Claims**



1. In a suspension system for a motor vehicle including a vehicle frame mounted on rotatable wheels and spring means for resiliently supporting said frame and preventing said frame from dropping onto said wheels, the improvement comprising:

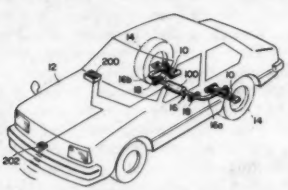
auxiliary suspension means comprising a layer of resilient material mounted to the underside of said frame and extending downwardly therefrom, said layer being mounted above said spring means and resting directly on supporting means therebelow when said vehicle is loaded such that said resilient material provides supplement support to said vehicle frame, said resilient layer being sufficiently thick to support said vehicle frame on said supporting means and separate said underside of said frame above said wheels in the event that said spring means rupture.

4,796,911

AUTOMOTIVE SUSPENSION SYSTEM WITH ROLL-STABILIZER HAVING ROAD CONDITION-DEPENDENT TORSION MODULUS, AND CONTROL OF TORSIONAL MODULES

Junsuke Kuroki, Yokohama; Tohru Takahashi, and Ken Ito, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 647,648, Sep. 6, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,821
Claims priority, application Japan, Sep. 9, 1983, 58-166353
Int. Cl.[4] B60G *21/00*
U.S. Cl. 280—689 **23 Claims**



1. An automotive vehicle suspension system comprising:

first means for rotatably supporting a pair of vehicle wheels and for supporting a vehicle body;

a roll stabilizer connected to said first means and extending perpendicular to the longtudinal axis of the vehicle, said stabilizer producing a damping force against rolling moment applied to said first means, said stabilizer including second means for adjusting torsion modulus of the stabilizer to adjust the damping force produced;

an actuator associated with said second means for operating said second means to adjust the torsion modulus of the stabilizer;

a detector adapted to detect a preselected vehicle driving condition-indicative parameter and produce a detector signal indicative thereof; and

a controller including means responsive to the detector signals for deriving a smooth or rough road condition indicative signal on the bases of the detector signals relative to a predetermined road roughness, and means responsive to the road condition indicative signal for providing a control signal indicative of the road condition to said actuator to activate the latter so as to adjust the torsion modulus of said stabilizer and the damping force produced thereby at least between a higher and a lower value responsive to the smooth or rough road condition indicative signal, respectively;

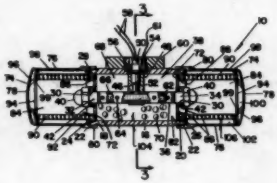
said stabilizer comprising a first torsion bar segment associated with a first portion of said first means near one of said vehicle wheels and a second torsion bar segment associated with a second portion of said first means near a second vehicle wheel, and said second means comprising a connector tube to which the proximal ends of said first and second segments are connected, said connector tube being filled with a magnetic fluid in which the concentration of ferromagnetic material included therein is subject to adjustable spacial gradients according to external magnetic fields, which in turn influences the torsion modulus of the stabilizer, and said actuator comprising third means for producing a magnetic field with an adjustable field strength around said connector tube, which field strength is determined by said control signal.

4,796,912

ELONGATE GAS GENERATOR FOR INFLATING VEHICLE INFLATABLE RESTRAINT CUSHIONS

Donald R. Lauritzen, Hyrum, and Gregory R. Goin, Smithfield, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Nov. 12, 1987, Ser. No. 119,764
Int. Cl.[4] B60R *21/26*
U.S. Cl. 280—736 **20 Claims**

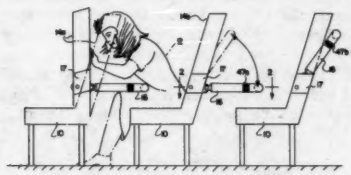


1. A gas generator for inflating a vehicle inflatable restraint cushion comprises a tubular member having a pair of end portions, a pair of plate members one of which is attached to one of said end portions of said tubular member and the other of which is attached to the other of said end portions to define a combustion chamber therewithin, a solid fuel gas generant composition contained within the combustion chamber, ignition means for igniting said solid fuel gas generant composition, a plurality of aperture means in each said plate member for effecting exit of generated gases from the combustion chamber, a pair of chamber means one of which is attached to one of said pair of tubular member end portions and the other of which is attached to the other of said pair of tubular member end portions for receiving and filtering the generated gases, and means for routing the generated gases from said pair of chamber means to an inflatable restraint cushion.

4,796,913
SAFETY BAR FOR VEHICLES

Gerald Amabile, and Ronald Rogers, both of Jessup, Pa., assignors to Safety Research and Manufacturing, Inc., Archbold, Pa.

Filed Mar. 9, 1987, Ser. No. 23,798
Int. Cl.[4] B60R *21/01*
U.S. Cl. 280—751 14 Claims



1. A restraining device for use with bench seats of the type used in school buses, wherein a restraining bar is attached to a forward seat to restrain passengers in the rearward seat directly behind said forward seat, comprising:

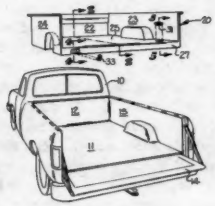
a hinge plate means mounted on the frame of the forward seat, said plate means presenting a profiled cam with a generally arcuate rear face having an upper limit position, a lower limit position, and a locking lower position, said plate means having a pivot pin on the outside of said plate means; and

a restraining bar having a restraining support sized to be positioned across the waist of passengers seated in the rearward seat, said restraining bar having an arm at each end of said support and extending to the frame of the forward seat, said arm having a slot sized to receive said hinge plate means pivot pin and said arm further having a lock pin sized and positioned to cooperatively contact said generally arcuate rear face to position said arm generally vertically in said upper limit position and generally horizontally in said lower limit position.

4,796,914
TRUCK BED LINER WITH BALLAST CHAMBER

Leighton A. Raynor, 335 E. Parker Rd., Morganton, N.C. 28655

Filed Jan. 14, 1988, Ser. No. 143,765
Int. Cl.[4] B62D *33/04*
U.S. Cl. 280—757 7 Claims

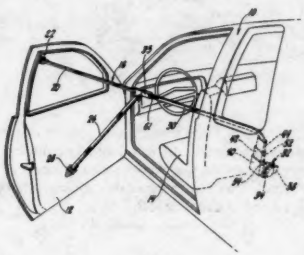


1. In a protective liner for a truck bed including a floor, a front wall, opposed side walls, and a rear access opening, said linear being shaped to be inserted in the truck bed and including corresponding bottom, front and opposed side walls, the combination therewith of ballast means incorporated in said protective liner for at times providing stability and traction for the truck in which said protective liner is positioned, said ballast means comprising a hollow compartment extending substantially throughout said bottom wall of said protective linear and defining a ballast chamber therein, a filling opening for permitting liquid ballast to be inserted in said ballast chamber when it is desired to provide additional weight on the rear portion of the truck, and a drainage opening for permitting removal of the liquid ballast from said ballast chamber when it is desired to reduce the weight on the rear portion of the truck.

4,796,915
SEAT BELT EXTENDER

Michael S. Kaurich, Sterling Heights, and Paul E. Rishel, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1987, Ser. No. 120,363
Int. Cl.[4] B60R *22/18*
U.S. Cl. 280—802 6 Claims



1. A seat belt extender for positioning a seat belt being unwound from a seat belt retractor, comprising:

at least a pair of sleeves telescopably slidable relative one another between retracted and extended positions and having belt passages through which the belt passes from the retractor toward the occupant, said sleeves having means acting therebetween by which extension of the endmost of the sleeves causes progressive extension of each of the other sleeves;

and detent means acting between the belt and the endmost of the sleeves to releasably couple the belt and the endmost of the sleeves so that unwinding and extension of the belt from the retractor causes the belt to carry the endmost sleeve therewith and thereby extend the other sleeves to their extended positions so that the sleeves support the belt at an extended position relative to the occupant, and said detent means releasing the belt from the endmost sleeve upon further extension of the belt.

4,796,916
INHIBIT CONTROL OF A BELTED VEHICULAR PASSIVE RESTRAINT SYSTEM HAVING DOOR-MOUNTED RETRACTORS

Lloyd W. Rogers, Utica, and David E. Compeau, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

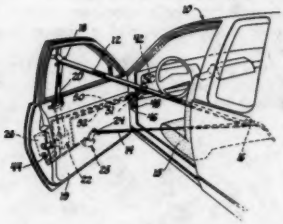
Filed Dec. 16, 1987, Ser. No. 134,171
Int. Cl.[4] B60R *22/40*
U.S. Cl. 280—803 7 Claims

1. In a motor vehicle seat belt system including a seat belt retractor mounted on a vehicle door, a motion sensitive mechanism for preventing belt movement through the retractor in response to a sensed motion, and a desensitizing mechanism energizable to inhibit operation of said motion sensitive mechanism, control apparatus for controlling energization of said desensitizing mechanism, comprising:

first and second switch means mounted in relation to the vehicle door for independently sensing and indicating closure or nonclosure of the vehicle door;

monostable means effective when either of said first and second switch means indicates nonclosure of the vehicle door for energizing said desensitizing mechanism for at least a predetermined interval; and

means effective in response to a condition wherein if both of said first and second switch means indicate nonclosure of the vehicle door within the predetermined interval of energization effected by said monostable means, then the energization of said desensitizing means is sustained so



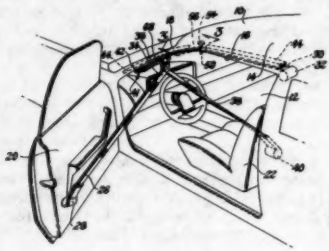
long as such condition persists, but if both of said first and second switch means do not indicate nonclosure of the vehicle door within the predetermined interval of energization effected by said monostable means, then the desensitizing means is deenergised.

4,796,917

PASSIVE SEAT BELT SYSTEM

Larry D. Miller, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1987, Ser. No. 97,725
Int. Cl.[4] B60R *22/06*
U.S. Cl. 280—804 **5 Claims**



5. In a passive seat belt system including a lap belt having an outboard end mounted on the door, a shoulder belt having an outboard end mounted on the body, a control belt having an inboard end mounted on the body inboard the seat and having an outboard end connected to the inboard ends of the lap and shoulder belts, retractor means associated with at least one of the belts to draw the lap and shoulder belts to restraining positions about a seated occupant, and a track mounted carriage slidably engaging the shoulder belt and movable forwardly along a roof mounted track upon door opening movement to move the shoulder belt forwardly and thereby move the lap belt forwardly and upwardly away from the seat to permit occupant ingress and egress, the improvement comprising:

said track extending further forwardly and downwardly along the windshield pillar to move the lap and shoulder belts further forwardly;

a belt supporting hook pivotally mounted on the body at the juncture between the roof rail and the windshield pillar;

spring means acting on the hook to urge the hook to a normal position extending into the path of movement of the carriage along the track, said spring yielding upon engagement of the carriage with the hook to temporarily pivot the hook away from the belt during movement of the carriage past the hook and then return the hook into the path of movement so that the hook supports the belt at the juncture of roof rail and windshield pillar during the further forward and downward movement of the carriage along the track;

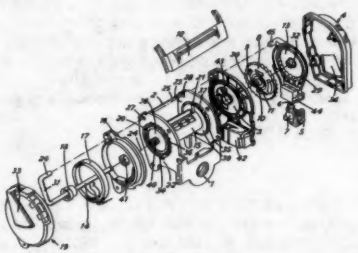
and a belt loop mounted on the pillar and surrounding the track in spaced relation therefrom to permit the carriage to move through the loop during said forward movement thereof whereby the further forward movement of the carriage after the carriage passes through the loop causes the shoulder belt to be doubled back from the carriage and deflected by the belt loop to lift the inboard ends of the lap belt and the shoulder belt higher while the carriage proceeds forwardly and downwardly along the pillar.

4,796,918

AUTOMATIC REWINDING TYPE SAFETY BELT RETRACTORS

Rudolph Meyer, Odelzhausen, and Martin Specht, Munich, both of Fed. Rep. of Germany, assignors to BSRD Limited, Carlisle, Cumbria, United Kingdom

Filed Apr. 5, 1988, Ser. No. 177,723
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711537
Int. Cl.[4] B60R *22/36, 22/40, 22/38*
U.S. Cl. 280—806 **9 Claims**



1. An automatic safety belt webbing retractor mechanism having a webbing reel (15) rotatable around the reel axle (14) for winding and unwinding a safety belt and biassed by a spring (17) said webbing reel being rotably moveably in a frame having two parallel side parts (22,23), locking teeth peripheries (20,21) provided at both ends of the webbing reel, said teeth being cooperable with teeth (36,37) disposed on the frame parts, an inertia device sensitive to exceeded vehicle deceleration or vehicle acceleration and/or accelerated belt movements for mechanical locking of the webbing reel (15) said webbing reel being supported so as to be able to make rocking movement between an operation position in which said webbing reel is freely rotatable and a locking position in which the teeth are engaged said inertia device comprising a toothed wheel (8) mechanically rotatable with the reel (15) and carried by a member (13) which carries one end of the reel axis pawl means (6 or 10) acting between said wheel (8) and said member (13) said member being rockable about a pivot under the effect of belt tension when such pawl means (6,10) are engaged to effect engagement of the teeth (20,21,36,37) for locking the reel characterised in that the distance of the axis of the pivot 45 of the member (13) from the axis of the reel is greater than the radius of the toothed peripheries of the reel and that means (14,26,31) are provided operable to synchronise engagement of the locking teeth (20,21;36,32) on each side of the reel (15).

4,796,919

VEHICLE SEATBELT DEFLECTION DEVICE

Scott R. Linden, 16044 Outer Bear Valley Rd., Victorville, Calif. 92392

Filed Jan. 12, 1988, Ser. No. 143,639
Int. Cl.[4] A47C *31/00*; B60R *35/00*
U.S. Cl. 280—808 8 Claims

1. In combination with a vehicle seatbelt which extends in a substantially vertical run from an outside anchorage on one side of a vehicle seat to a door post anchorage, and which then extends in a diagonal run from the door post anchorage to a buckle means adapted for detachable connection to an inside anchorage on the other side of the vehicle seat, an improved deflection device for shortening the diagonal run and disposing it at a greater angle relative to the vertical run to suit the seatbelt to a smaller seat occupant, the deflection device comprising:

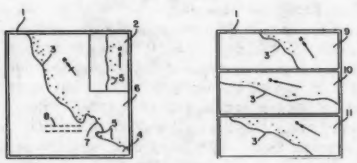
clamping means operative to fixedly clamp the diagonal run to the vertical run below the door post anchorage at a location which is selected to dispose the diagonal run at a desired angle relative to the vertical run, the clamping means in operation being freely movable relative to fixed structure of the vehicle, the clamping means preventing the diagonal run from moving relative to the vertical run at the location of the clamping means.

4,796,920

NAUTICAL CHART FOR PILOTING

John M. Landry, Sassaman Ct., Punta Gorda, Fla. 33955, and Paul L. Ravenna, Rd. 1, Box 33B, Waitsfield, Vt. 05673

Continuation of Ser. No. 817,490, Jan. 9, 1986, Pat. No. 4,687,230. This application Aug. 14, 1987, Ser. No. 86,389
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—34 30 Claims



1. A nautical chart having a combination of indicia comprising:

(a) a least one small scale chart suitable for piloting having a representation of a shoreline; and

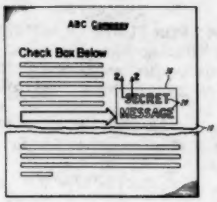
(b) a plurality of large scale charts, said large scale charts in combination present a substantially continuous shoreline, said substantially continuous shoreline formed by said combination of said large scale charts presents an extension of said shoreline of said small scale chart and/or overlaps said shoreline of said small scale chart.

4,796,921

HIDDEN PRINTING

Ralph Neiman, Dayton, Ohio, assignor to Penny-Ohlmann-Neiman, Inc., Dayton, Ohio

Filed Feb. 2, 1987, Ser. No. 9,782
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—91 4 Claims



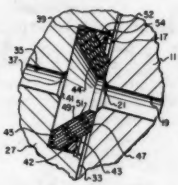
1. An article having a secret message which can be conveniently identified, comprising a sheet of translucent paper which is white in color and capable of transmitting natural light, a first portion of the sheet having printed thereon a first ink which has a color different from white and which forms visually identifiable information, a second portion of the sheet being free of the first ink and having printed thereon a white ink, said second portion of the sheet being less translucent in the area of the white ink, and said white ink forming a secret message, and said secret message being visually readable when viewing natural light through the second portion of the sheet.

4,796,922

SUBSEA MULTIWAY HYDRAULIC CONNECTOR

Richard M. H. Prichard, Katy, Tex., assignor to Vetco Gray Inc., Houston, Tex.

Filed Dec. 30, 1987, Ser. No. 139,686
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—26 5 Claims



1. For a subsea well assembly, a hydraulic connector comprising in combination:

a pair of connector members, each having a hydraulic seat and a plurality of hydraulic passages, each hydraulic passage having a port terminating at the hydraulic seat;

means for coupling the connector members rigidly together, with the hydraulic seats seating against each other and the ports of one of the connector members registering with the ports of the other connector member;

a counterbore located at the port of each hydraulic passage of one of the connector members, defining a base recessed below the hydraulic seat of that connector member;

a seal element located in each counterbore, the seal element being generally frusto-conical and having a passage therethrough for the passage of hydraulic fluid from one of the ports of one of the connector members to another port of the other connector member, the seal element having a base in contact with the base of the counterbore and a face protruding out of the counterbore a short distance for compression against the hydraulic seat of the other con-

nector member surrounding one of the ports when the connector members are coupled together; and

the seal element being formed of at least one conical metal lamination and at least one elastomer lamination bonded to each other, the elastomer lamination having ends which protrude past ends of the metal lamination a short distance prior to the coupling of the connector members together.

4,796,923

JOINTS FOR TUBULAR MEMBERS

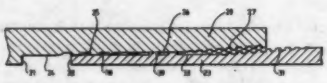
Brian D. Liggins, Kettering; Timothy S. Round, Gretton; Stuart J. Welch, Burton Latimer, and Gordon F. Reynolds, Corby, all of England, assignors to British Steel Corporation, United Kingdom

Filed Jul. 21, 1987, Ser. No. 76,029

Claims priority, application United Kingdom, Jul. 22, 1986, 8617827

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—27 **7 Claims**



1. A joint between two tubes comprising a box at one end of one tube and a pin at one end of the other tube, the pin being provided on its external surface with a threadless zone at its nose serving as a stabbing guide for entry of the pin into the box, a parallel threaded load carrying zone, and an inclined threaded locking and load carrying zone; the box being provided on its inner surface with a parallel threaded load carrying zone, and an inclined threaded locking and load carrying zone, both generally matching and engageable with the corresponding zones of the pin, and an unthreaded stabbing guide zone axially disposed between said parallel load carrying zone and said inclined locking and load carrying zone of the box; the parallel load carrying zone in the box serving as an extension of the stabbing guide provided between the parallel load carrying zone and the inclined locking and load carrying zone for the nose of the pin, and two threaded zones in the box being so separated that the parallel threaded load carrying zone engages with the corresponding threaded zone on the pin firstly on make-up of the joint; the inclined locking and load carrying threaded zones of the pin and box comprising double start threads and the parallel load carrying zones of the pin and box comprising single start threads.

4,796,924

COUPLING FOR MULTI-PASSAGE TUBE

Seiji Kosugi; Norio Ando, and Hisao Sagara, all of Sohka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

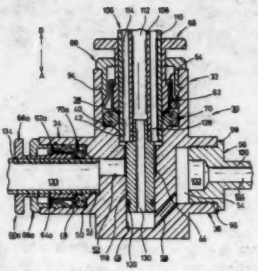
Continuation of Ser. No. 824,235, Jan. 30, 1986, abandoned. This application Feb. 2, 1988, Ser. No. 153,569

Claims priority, application Japan, Aug. 20, 1985, 60-127106[U]; Aug. 26, 1985, 60-130687[U]

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—39 **3 Claims**

1. A coupling for a multi-passage tube having first and second fluid passages therein, comprising a body having first and second passages corresponding to the first and second fluid passages of the multi-passage tube, a recess formed in said body, a guide member seated in said recess, a radially flexible release bushing mounted on an outer annular surface of said tube and extending into said recess, said bushing being axially movable on said tube, a radially flexible chuck mounted on an outer annular surface of said bushing and having a portion engaged with said outer annular surface of said tube, a radially flexible collet mounted on an outer annular surface of said chuck, said coupling having a cylindrical portion connected within and extending from said first passage of said tube, said cylindrical portion defining a third passage therein aligned with said first passage of said tube for providing communication between the first passage of the tube and the first passage of the body, said cylindrical portion having an outer surface, and said coupling member defining a fourth passage between



said cylindrical portion outer surface and said body, said fourth passage communicating between said second passage of the tube and said second passage of the body, whereby in response to axial movement of said release bushing on said tube, said bushing urges said chuck and collet radially outwardly for releasing said tube.

4,796,925

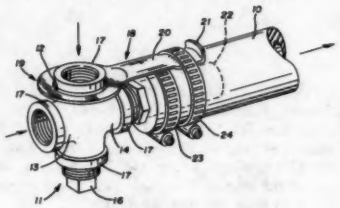
SAFETY RETAINER CLIP

Fred Zwicker, 7075 State Rt. 14, By-Pass, Canfield, Ohio 44406

Filed Sep. 11, 1987, Ser. No. 95,160

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—114 **3 Claims**



1. A safety retainer clip for use on a high pressure hose and associated fitting having multiple outlets comprises a single elongated flattened body member, said body member having an apertured enlarged end portion for fitting around one of said outlets and a oppositely disposed single elongated transversely curved hose portion extending from said body member and terminating in a free end, an arcuate upstanding flange on the free end of said elongated hose end portion, a first clamping means separate from and secured over said elongated hose portion and said hose adjacent said upstanding flange, a second clamping means separate from said hose portion and engageable on said hose adjacent said first clamping means.

4,796,926

DUMP FITTING FOR SEWER HOSE

Benny L. Rapsilver, Rt. 4 Box 2640, Nacogdoches, Tex. 75961

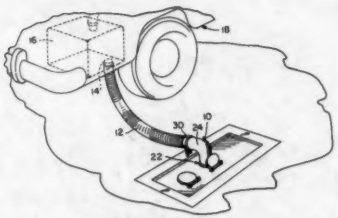
Filed Dec. 23, 1986, Ser. No. 945,685

Int. Cl.[4] F16L *43/00*

U.S. Cl. 285—181 **2 Claims**

1. In combination with a flexible sewer hose for discharging effluent from a holding tank of a recreational vehicle, a rigid

dump fitting in the form of a tubular elbow connected to a discharge end of the hose, the dump fitting having an outlet for close fitting telescopic insertion in a sewer drain to enable flow of effluent from the hose into the sewer drain without interruption and being of a weight sufficient for preventing the discharge end of the hose from jumping out of the drain under the influence of thrust created by effluent flowing through the hose, said dump fitting having an inlet limb telescopicallv inserted in the discharge end of the sewer hose and hold in place by a hose clamp encircling the hose, and an outlet limb telescopically inserted into the sewer drain in close fitting



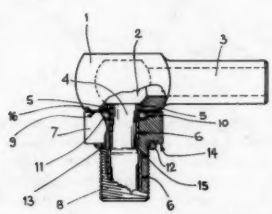
relation with both limbs being rigid and provided with a spigoted end portion, said fitting being a two-piece molding of hard plastic comprising first and second sections and means for releasably connecting the sections substantially along a midplane of the elbow, said connecting means comprising a spigot element on one section telescoped into the other section, an O-ring seal carried on the spigot element and external interengageable latch elements on the respective sections, said latch elements including eye hooks pivotally mounted on one of the sections and eye hook keepers in the form of headed projections on the other section.

4,796,927

MOBILE JOINT FOR CONNECTORS

Alfredo D. Bona, Abbiategrasso, and Attilio Airaghi, Cornaredo, both of Italy, assignors to Murray Europe S.p.A., Milan, Italy

Filed Jun. 15, 1987, Ser. No. 63,006
Claims priority, application Italy, Nov. 3, 1986, 23573/86[U]
Int. Cl.[4] F16L *27/08*
U.S. Cl. 285—190 **4 Claims**



1. A mobile joint for connecting two tubes (3 and 4) which comprises:

(a) a central body (1) provided with a compartment (2), into which said two tubes (3, 4) converge, one (3) of said tubes being integral with said central body (1), the other tube (4) having two ends and being fixed to said central body (1) and being provided with an enlarged drawing die portion (15) in the end opposite to the end fixed to said central body;

(b) a hollow bolt inserted over said tube (4) fixed to said central body (1), said bolt having a faceted head (7), a threaded part (8) and a central duct (6) provided with a wider portion at the end thereof, said bolt being inserted over the tube (4) whereby the faceted head (7) comes into contact with said central body (1) and said enlarged portion (15) of said tube (4) matches the widening of said central duct (6);

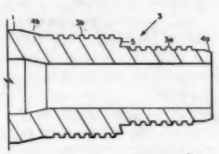
(c) said faceted head having upper (9) and lower (14) surfaces, elastic annular gaskets (11, 12) arranged on the upper (9) and lower (14) surfaces of said faceted head (7), respectively, wherein said first annular gasket (11) is inserted into an annular seat (10) machined on said upper surface (9) of said head (7) and said second annular gasket (12) is inserted in a groove (13) machined on said threaded portion (8) of the bolt between the lower surface (14) of the head (7) and the threaded part (8) of the bolt, and wherein said central body (1) has a lower surface (16) and said upper annular gasket (11) is compressed and sealed between said annular seat (10), said upper surface (9) of said head (7) of said bolt and said lower surface (16) of said central body (1) by forming the enlarged portion of said tube (4) with a drawing die.

4,796,928

THREADED CONNECTION FOR PIPES AND METHOD OF FABRICATING SAME

Frank J. Carlin, Houston, Tex., and Terrell F. Wafford, Wilburton, Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 28, 1987, Ser. No. 101,653
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—334 **2 Claims**



1. A threaded connection for pipe produced in accordance with A.P.I. specifications comprising a pin portion formed on one pipe end and a box portion formed on another pipe end; said pin portion being formed to an internal diameter that is greater than the A.P.I. drift diameter by 0.001 to 0.003 inches; said box portion being formed to an external diameter equal to the max A.P.I. diameter +0.000"−0.002"; and cooperating threads formed on the exterior of said pin portion and on the interior of said box portion; said cooperating threads comprising axially adjacent large and small diameter threads; said axially adjacent threads being machined to the following dimensional relationship:

$$P1=B1=A1+A2;$$

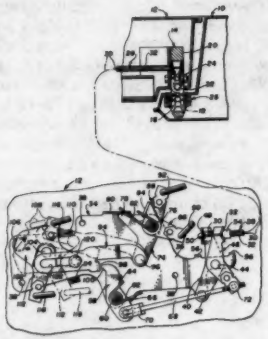
where P1 is the root diameter of the small diameter thread on the pin end of the pipe; B1 is the difference between the root diameter of the small diameter thread in the box end of the pipe and said machined outer diameter of said box end; A1 is the difference between the root diameter of said large diameter thread in said box end of the pipe and said machined outer diameter of said box end; and A2 is the difference between the root diameter of the large diameter thread on said pin end and said machined inner diameter of said pin end.

4,796,929

CLOSURE LATCH CONTROL MECHANISM

Bela Gergoe, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1987, Ser. No. 92,102
Int. Cl.[4] E05C 3/26
U.S. Cl. 292—28 1 Claim



1. In combination with a closure latch including latch means movable between latched and unlatched positions by the relative movement of a cable member and a sheath member housing the cable member, a control mechanism for moving the cable and sheath relative to each other comprising, in combination,

a support, a first lever pivoted to the support, a second lever pivoted to the first lever, means connecting the first lever to the sheath member, means connecting the second lever to the cable member, an intermediate lever pivoted to the support and operatively connected to the second lever for pivoting the second lever relative to the first lever to move the cable member relative to the sheath member and move the latch means to unlatched position, latch operating means operatively connected to independently actuatable inside and outside closure latch operators, a coupling member operatively connected to the latch operating means for movement upon operation of either the inside or the outside closure latch operator, the coupling member including means cooperatively engageable with the intermediate lever for pivoting the intermediate lever upon movement of the coupling member, and locking means operatively connected to the coupling member for moving the coupling member between a coupled position and a bypass position with respect to the intermediate lever, the coupling member engageable means bypassing the intermediate lever when the coupling member is in bypass position to uncouple the inside and outside operators from the intermediate lever and block movement of the latch means to unlatched position.

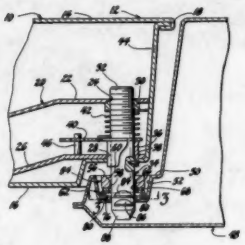
4,796,930

CLOSURE LATCH

Dennis Baynes, Coventry, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 19, 1987, Ser. No. 87,028
Int. Cl.[4] E05C 5/04; E05B 15/02
U.S. Cl. 292—58 4 Claims

1. A closure latch for releasably latching a vehicle closure to a vehicle pillar comprising, in combination, an elongated cylindrical latch bolt having threaded and non-threaded exterior surface portions and a circumferentially spaced pair of exterior coplanar grooves, means threadably mounting the threaded portion of the latch bolt on the vehicle closure for concurrent rotational and axial movement of the latch bolt relative to the vehicle closure, means releasably securing the threadedly mounting means to the closure, second means mounting the non-threaded portion of the latch bolt on the vehicle closure for concurrent rotational and axial movement relative thereto, means locating the latch bolt in a predetermined rotational position relative to the vehicle closure and permitting axial movement of the latch bolt independently of the locating means while in such rotational position, a pair of striker members, each having a free edge portion shaped for mating with a respective latch bolt groove, means mounting the striker members on the vehicle pillar for movement toward each other and



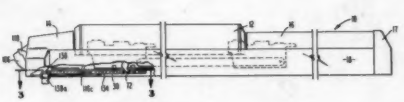
into latching engagement with a respective latch bolt groove to block withdrawl of the latch bolt from between the striker members, release of the releasable securing means from the closure and subsequent rotational movement of the threadedly mounting means relative to the latch bolt member when the latch bolt member is in the predetermined position adjusting the position of the latch bolt grooves relative to the free edge portions of the striker members to provide matching engagement of such free edge portions of the striker members with their respective latch bolt grooves.

4,796,931

EXIT DEVICE HAVING ADJUSTABLE BACKSET

George E. Heid, Charlotte, N.C., assignor to Yale Security Inc., Monroe, N.C.

Filed Aug. 7, 1987, Ser. No. 82,749
Int. Cl.[4] E05B 65/10
U.S. Cl. 292—92 9 Claims



1. An exit device comprising a base plate secured to one side of a door, a touch bar mounted on the base plate for rectilinear movement toward and away from the base plate, spring means biasing the touch plate away from the base plate, a latch assembly mounted at one end of the base plate and including a latch mounted for pivotal movement at a position adjacent the edge of the door, and actuating means connected to the touch bar and terminating in a finger under the base plate and adapted to move the finger when the touch bar is pressed, the latch assembly comprising a retracting linkage connected to the latch and terminating at its opposite end in a projection under the base plate spaced from the finger, an exterior operator mounted on the opposite side of the door and extending through the door, an apertured drive plate under the base plate and receiving in its apertures respectively the finger and the projection for movement together with the drive plate, cam means adjacent the drive plate and connected to the operator, the cam means being adapted when the operator is moved to shift the drive plate along the base plate, the cam means and the drive plate being positionable in a plurality of locations on the base plate

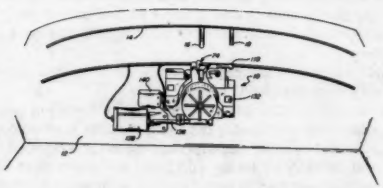
so that the device can accommodate different backset distances for the exterior operator.

4,796,932

REMOTE RELEASE AND PULL-DOWN UNIT

Omar D. Tame, W. Bloomfield, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Sep. 22, 1987, Ser. No. 99,761
Int. Cl.[4] F05B 65/19
U.S. Cl. 292—112 18 Claims



1. A mechanism for releasing a compartment panel of a vehicle from a closed position, and pulling down said panel to said closed position, comprising:

a housing,

a rotatable eccentric driving member,

means for rotating said eccentric driving member,

a latch hook forming a hook end and a pivot, said pivot coupled to said eccentric driving member at a position displaced from the center of rotation of said eccentric driving member, said housing defining cam surfaces acting on said latch hook such that rotation of said eccentric driving member causes said latch hook end to extend from said housing and pivot wherein, in a first position of said eccentric driving member, said hook end engages an engagement feature of said panel and maintain said panel in said closed position, and said eccentric driving member moveable to a second position wherein when said eccentric driving member is moved between said first and second positions, said latch hook pivots causing said hook end to disengage said engagement feature enabling said compartment panel to be released,

first switch means for responding to the position of said compartment panel such that when said compartment panel is being closed, said means for rotating is energized causing said eccentric driving member to be rotated from said second to said first position thereby pulling down said compartment panel to said closed position,

second switch means for responding to the position of said eccentric driving member for de-energizing said means for rotating to cause said eccentric driving member to dwell at said second position, and

third switch means for responding to the position of said eccentric driving member to cause said eccentric driving member to dwell at said first position.

4,796,933

WINDOW SASH WITH FRAME AND OPERATING HANDLE

Per G. Nielsen, Horsens; Elgard Nielsen, Ostbirk, and Steen Nygaard, Frederikssund, all of Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark

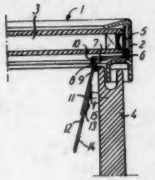
PCT No. PCT/DK86/00062, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07404, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 11, 1986, Ser. No. 26,549
Claims priority, application Denmark, Jun. 13, 1985, 2663/85
Int. Cl.[4] E05C 17/18
U.S. Cl. 292—265 5 Claims

1. A window sash to be hinged in an associated casing, comprising:

a frame;

a glass pane mounted in said frame, and having an inner side and an outer side;

a holder secured to the sash between said frame and said pane and by said frame and said pane and having a portion extending along said inner side of the pane past an inner edge of said frame;



an operating handle releasably mounted on said holder portion and adapted to hold the sash in at least one position relative to said casing; and

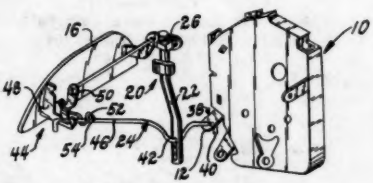
means associated with said holder for allowing said operating handle to be mounted on said holder portion while preventing an unintentional removal of the holder therefrom, said means comprising a leaf spring.

4,796,934

RELEASE LINKAGE FOR DOOR LATCH

Thomas A. Kesel, Dearborn, and Robert M. Paszko, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1987, Ser. No. 137,638
Int. Cl.[4] E05B 65/20; F05C 3/26
U.S. Cl. 292—336.3 12 Claims



1. A release linkage for the latch of an automotive vehicle door, the latch having a release lever pivotally mounted for operative movement between latched and unlatched conditions, and the door having an inside handle mounted thereon and connected to the release lever for effecting the operative movement and an outside handle mounted for pivotal movement with respect to the door, the release linkage comprising:

a mounting clip pivotally mounted on the outside door handle;

a release link clampingly engaged by the mounting clip;

an elongated actuating rod having one end supported on the outside door handle and the other end operatively connected to the release level and having an intermediate actuating portion;

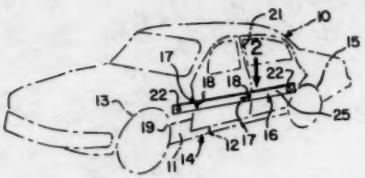
and lost motion means for interconnecting the release link and the actuating rod actuating Portion to prevent movement of the release lever in response to operative movement of the inside handle.

4,796,935

PROTECTIVE BODY BUMPER STRIP FOR A MOTOR VEHICLE

Charles Marais, 24-13 33rd St., Astoria, N.Y. 11102

Filed Jul. 20, 1987, Ser. No. 75,414
Int. Cl.[4] B60R 19/04
U.S. Cl. 293—128 5 Claims



1. A protective body bumper strip for a motor vehicle, said bumper strip comprising:

(a) an elongated elastic belt to be positioned against side body of the motor vehicle between front wheel well and rear wheel well;

(b) a pair of clamping members, spaced apart and affixed to said belt so that said clamping members can removably engage with forward and rearward edges of front door of the motor vehicle, said clamping members including a clip member having at least one hook arm to removably engage with one of the edges of the front door of the motor vehicle, said clip member positioned on inner surface of said belt, and a face plate positioned on outer surface of said belt in the vicinity of said clip member, and means for fastening said face plate to said clip member with said belt being affixed there between; and

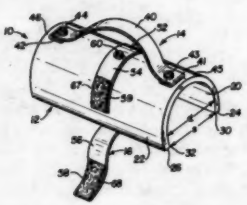
(c) a pair of suction cups, spaced apart and affixed to said belt so that said suction cups can removably engage with the side body of the motor vehicle to position the belt and give maximum protection against minor damage thereto.

4,796,936

GAS CYLINDER CARRIER

Patrick M. Sherin, P.O. Box 911, Beaver Falls, Pa. 15010

Filed Jan. 15, 1988, Ser. No. 144,104
Int. Cl.[4] B65D 63/18
U.S. Cl. 294—31.2 4 Claims



1. A carrier for a compressed gas cylinder and the like comprising

a cylinder engaging member including a segment of a tube having an inner face, an outer face, a first end face, a second end face, a first inner edge formed at the intersection of said inner face and said first end face and a second inner edge formed at the intersection of said inner face and said second end face,

said segment having an arc the angle of which is in excess of 180° and having an inner diameter which is at least as small as the outside diameter of said cylinder,

said first inner edge and said second inner edge being spaced apart from each other a distance less than said outside diameter of said cylinder,

said cylinder engaging member being made of material which is elastic to an extent which permits said first and second inner edges to be opened outwardly such that the distance between said edges is equal to said outside diameter of said cylinder without exceeding the elastic limit of said material,

strap means associated with said cylinder engaging member for holding said first and second inner edges said distance less than said outside diameter of said cylinder, said strap means including an elongated strip of material having a top side, a bottom side, a free end, and an opposing fixed end which is mounted onto said cylinder engaging member,

said strap means having fastener means in operative association therewith, and

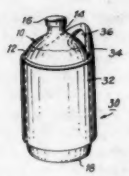
handle means attached to said cylinder engaging member, whereby said cylinder engaging member is pressed down onto said cylinder and said strap means is wrapped around said cylinder by taking said free end of said strap having said fastener means, wrapping said strap means around the portion of said cylinder not engaged by said cylinder engaging member and contacting said fastener means to said fastener means disposed on said fixed end of said strap so that said cylinder will be held firmly and securely in place by said cylinder engaging member so that said cylinder may be carried away by use of said handle means.

4,796,937

INSULATING SHELL AND POURING AID FOR CONTAINER AND METHOD OF MAKING SAME

Douglas J. Andrea, 165 Brookville La., New York, N.Y. 11545

Filed Oct. 6, 1987, Ser. No. 106,227
Int. Cl.[4] B65D 25/18, 81/38
U.S. Cl. 294—31.2 8 Claims



1. An insulating shell for a container having a main body portion with an outer surface configuration comprising:

a shell of insulating material formed of a shape to define a central opening corresponding to the outer surface configuration of the container main body portion;

said shell having a central portion to encompass a substantial part of the main body portion of the container to insulate the container contents, and

an integral handle portion formed in the shell extending from and along the shell central portion and having an opening therein with at least a part of said opening adapted to extend above the container central body portion.

4,796,938

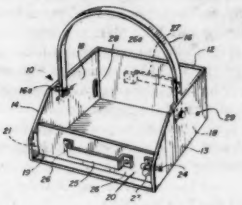
GARDEN SCOOP

Douglas Knights, Route 1, Box 291, Sandwich, Ill. 60458

Continuation-in-part of Ser. No. 907,119, Sep. 12, 1986, abandoned. This application Nov. 24, 1987, Ser. No. 124,816
Int. Cl.[4] A47F 13/08; B65F 1/06
U.S. Cl. 294—55 8 Claims

1. A garden scoop for removing trash or carrying objects comprising a flat rectangular bottom, an upstanding back wall, opposite side walls having a sloping front opposite the back

wall, and a front gate between the side walls and adjacent the bottom, said front gate being detachably mounted for facile



removal and replacement and a handle mounted on said side walls adapted for carrying said garden scoop.

4,796,939

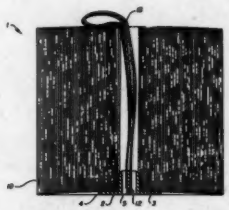
LIFTING MEANS

Darrell Symonds, Perth, Australia; Kenneth R. King, and William N. Smith, both of Savannah, Ga., assignors to CorSling, Inc., Savannah, Ga.

Filed Mar. 4, 1987, Ser. No. 21,882

Int. Cl.[4] B65H *49/00*; B66C *1/16*

U.S. Cl. 294—67.1 **10 Claims**



1. An assembly for effecting the lifting of a roll of paper having a hollow interim core, a plurality of wrapped layers and a bottom face, said assembly including a support device provided at one end of said hollow core and a flexible lifting sling attached to said support device and extending through said hollow core so as to protrude from the opposite end of said hollow core, said support device including a horizontally extending support plate having substantially flat top and bottom surfaces, an upwardly extending member centrally positioned on said support plate and being integrally formed therewith, said upwardly extending member including means defining a hollow interior extending therethrough a web member positioned within said hollow interior and extending across the full interior dimension thereof for engaging said sling and having a bottom surface spaced a predetermined distance inwardly from the bottom of said device, said support plate extending outwardly beyond said upwardly extending member so that it will extend radially beyond said hollow core and engage the bottom face of the paper roll and a plurality of but less than all of the wrapped layers forming the paper roll.

4,796,940

DISPOSABLE HAND GRIP FOR USE WITH PLASTIC BAG LOOP HANDLES

Bernard Rimland, 4182 Adams Ave., San Diego, Calif. 92116

Continuation-in-part of Ser. No. 22,924, Feb. 26, 1987, abandoned. This application Sep. 11, 1987, Ser. No. 95,305

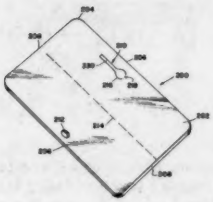
Int. Cl.[4] A45F *5/10*; B65D *33/06*

U.S. Cl. 294—171 **7 Claims**

1. An attachable hand grip for encircling handles of plastic carrying bags or the like, consisting of

a generally fat body portion formed of substantially uniform plastic sheet material of about 20–40 mils thickness sufficiently flexible to be bent into a generally U-shaped configuration to provide an inside surface and an outside surface, said body portion being generally rectangular with a pair of opposite side edges and a pair of opposite end edges;

said side edges being sufficiently soft to constitute cushioning means for cushioning handles of carrying bags or the



like so as to prevent the cutting or tearing of such handles; and

fastening means unitary with said body portion for fastening opposite ends of said body portion together near said end edges when said body portion has been folded to a generally U-shape, said fastening means comprising a male member die cut generally adjacent one end edge and an interengagable female member adjacent another end edge extending entirely through said body portion.

4,796,941

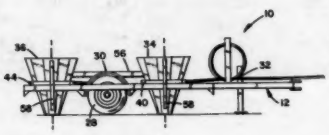
TREE TRANSPORT TRAILER

Clyde L. Reilly, RR 1-Box 73, Crystal, N. Dak. 58222

Filed Aug. 19, 1987, Ser. No. 86,736

Int. Cl.[4] B60P *3/00*

U.S. Cl. 296—3 **14 Claims**



1. A tree transport trailer, which comprises:

a frame;

a pair of laterally spaced-apart wheels supporting said frame for travel;

an underlying surface supporting said wheels;

hitch means for releasably connecting said frame to a tow vehicle;

a plurality of tree carriers, each having a longitudinal center line extending between an open top end and a convergent bottom end, mounted in spaced-apart relationship on said frame for pivotal movement about axes offset from the center lines of said carriers between lowered positions wherein their bottom ends are supported in stopped engagement with the underlying surface for loading/unloading by a tree space, and raised positions out of engagement with the underlying surface for travel; and

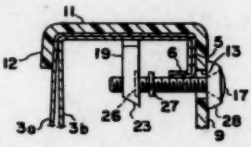
means for selectively actuating said carrier between said positions.

4,796,942

ANCHORING OF TRUCK BED LINERS

Bernard L. Robinson, Coleman, and George L. Pickard, Beaverton, both of Mich., assignors to Homestead Products, Inc., Coleman, Mich.

Filed Aug. 3, 1987, Ser. No. 80,667
Int. Cl.[4] B62D *33/00*
U.S. Cl. 296—39.2 13 Claims



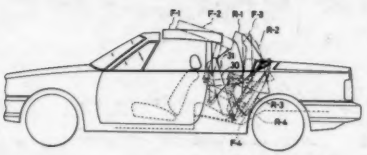
1. A fastener for use in securing a liner side wall to a pickup truck cargo box having a wall terminating at its upper end in a transverse sill joined to a depending flange, said side wall having an aperture therein at a level below that of said flange, said fastener comprising a bolt having a cylindrical, threaded shank extending through said aperture and terminating at one end in an enlarged head; and an elongate anchor member having a correspondingly threaded bore adjacent one end thereof and through which said shank extends, said anchor member being rotatable with and relative to said bolt and having a length from said bolt to the opposite end of said anchor member greater than the maximum distance between said bolt and said sill whereby conjoint rotation of said bolt and said anchor member effects engagement between said opposite end of said anchor member and said sill and prevents further rotation of said anchor member, thereby enabling said anchor member and said head to move toward one another into clamping engagement with said flange.

4,796,943

CONVERTIBLE VEHICLE BODY STRUCTURE HAVING A REAR SEAT

Hisao Fukutomi; Takanori Tuchiya; Takeshi Yamamoto; Takeshi Konishi, and Iseo Hamasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 20, 1986, Ser. No. 932,949
Claims priority, application Japan, Nov. 20, 1985, 60-260833; Nov. 20, 1985, 60-260835; Apr. 30, 1986, 61-99828
Int. Cl.[4] B60J *7/14*
U.S. Cl. 296—65.1 4 Claims



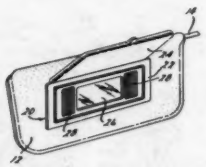
1. A convertible vehicle body structure including body means which includes front windshield means having an upper edge portion, a rear body section having an upper edge defining a belt line and front and rear seat means respectively each having seat back means, said seat back means of said rear seat means being movable between an upright position and a forwardly inclined position, locking means for locking said seat back means of the rear seat means in the upright position, to said rear body section, retractable roof panel means movable between an erected position wherein it covers a top portion of a passenger compartment and a retracted position wherein it is retracted in the rear body section first means for actuating the roof panel means between the erected and retracted positions, second means for inclining the seat back means of the rear seat means forwardly, said second means including lock releasing means for releasing the locking means, sequential control means for operating the second means and the first means sequentially to incline the seat back means of the rear seat means forwardly and actuate the roof panel means, said locking means including a locking plate provided on the rear body section and having a locking edge and a locking lever swingably mounted on the seat back means of the rear seat means, said locking lever having a locking pawl adapted to be engaged with said locking edge of the locking plate, resilient means for biasing the locking lever to a position wherein the locking pawl is engaged with the locking edge of the locking plate, said releasing means being means for acting on the locking lever to swingably move the locking lever so that the locking pawl is disengaged form the locking edge.

4,796,944

SPRING-LOADED HINGE ASSEMBLY FOR VEHICLE ACCESSORIES

Mark Lobanoff, Troy, and James A. Gavagan, Centerline, both of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Division of Ser. No. 910,129, Sep. 22, 1986, Pat. No. 4,715,644.
This application Dec. 28, 1987, Ser. No. 138,314
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97.5 14 Claims



1. A spring-loaded hinge assembly for interconnecting an accessory door with an accessory housing structure for a vehicle, said hinge assembly comprising: pivot means pivotally interconnecting the door with the housing structure for rotational movement of the door relative to the housing structure about a longitudinally-extending axis; a cam member protruding in a generally lateral direction from the housing structure; resilient biasing means disposed on the door for rotational movement therewith, said resilient biasing means being slidably and resiliently deflectably engageable by said cam for exerting a resilient biasing force on said cam in a generally lateral direction generally toward said axis; and support means interconnected with the door for supporting said resilient biasing means in a direction generally opposite the direction of said engagement of said resilient biasing means by said cam, said support means including seat portions for slidably supporting said resilient biasing means at least at two spaced-apart locations thereon.

4,796,945

AGRICULTURAL WAGON PROTECTIVE COVER

Danny D. Congdon, 73 Evergreen St., Cortland, N.Y. 13045

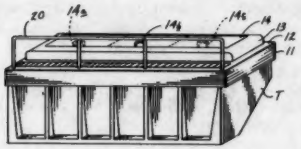
Filed Aug. 3, 1987, Ser. No. 80,797
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 8 Claims

1. A new and improved agricultural wagon protective cover for use with a load carrying vehicle comprising a substantially planar surface; and

a continuous flange means depending downwardly from said planar surface for forming an interfitting relationship with said load carrying vehicle, and

a hatch means depending upwardly of and integrally secured to said planar surface for enabling access through said protective cover including a pivoting hatch portion

wherein said hatch portion comprising at least one pivoting hatch, and



a longitudinal brace positioned medially of said hatch means to brace said hatch portion and provide support thereto.

4,796,946

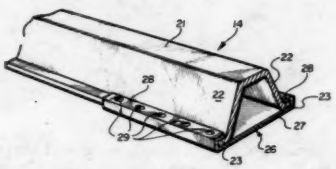
AUTOMOTIVE VEHICLE DOOR AND BAR REINFORCEMENT

Roland B. Wilson, Valparaiso, Ind.; Jack M. Shapiro, Homewood, and Richard S. Cline, Crete, both of Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed Sep. 4, 1987, Ser. No. 92,956

Int. Cl.[4] B60J *5/00*; B21C *37/04*; C22C *38/18*

U.S. Cl. 296—146 **16 Claims**



1. An elongated steel shape particularly adapted for use as a strengthening or reinforcing member for imparting crush resistance to a side impact against an automotive vehicle door, comprising

a high strength alloy steel section having a predetermined shape, including an elongated web portion and elongated laterally extending flange portions;

said steel section being hot rolled directly from a billet to said predetermined shape and thereafter air cooled;

said high strength alloy steel containing about 0.14 to 0.21% carbon; about 3 to 4% of at least one hardenability element selected from the group consisting of manganese, chromium, molybdenum, boron, columbium, vanadium, and nicket; about 0.3 to 1.0% silicon; and the balance essentially iron; and

said steel section having a minimum tensile strength of about 150,000 lb/in^2 and a total elongation of at least about 7.5%.

4,796,947

REVERSIBLE MOTOR VEHICLE ROOF

Lelio Alfonso, Turin, Italy, assignor to Valko S.r.l., Turin, Italy

Filed Jul. 24, 1987, Ser. No. 77,249

Claims priority, application Italy, Aug. 1, 1986, 67625 A/86

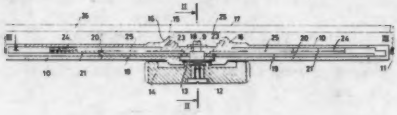
Int. Cl.[4] B60J *7/057*

U.S. Cl. 296—223 **9 Claims**

1. A reversible roof for a motor vehicle, comprising:

a hollow elongate body fixed to the frame of the roof and in which there are mutually slidable towards and away from one another the distal ends of a lamina whose central section protrudes from an opening of the hollow body and is rigidly connected to the reversible roof;

manual control means for actuating a mechanical transmission contained within the body which is separately connected and acts at the distal ends of the lamina, thereby sliding the lamina in opposite directions towards and away



from the control means thus producing the opening and closing of the roof, respectively.

4,796,948

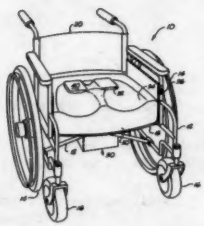
PATIENT SUPPORT SYSTEM FOR WHEELCHAIRS AND THE LIKE

Patrick R. D. Paul, 13100 Pelican Watch Villas, Johns Island, S.C. 29455; James H. Price, 1118 Shadow Lake Cir., Mt. Pleasant, S.C. 29464, and Kenneth Olshansky, 7029 Chowning Cir., Richmond, Va. 23229

Filed Feb. 14, 1986, Ser. No. 829,312

Int. Cl.[4] A47C *7/14*, *27/08*

U.S. Cl. 297—284 **9 Claims**



1. An improved support system for a patient in a sitting attitude comprising:

(a) first resilient support means for supporting body portions of the patient proximate the ischial tuberosities of the patient, said first support means forming an annulus region therein for unsupported receipt of the ischial tuberosities of the patient;

(b) normally deflated inflatable second fluid support means, situated in annulus region of said first support means and configured accordingly, for receiving and supporting upon periodic inflation thereof ischial tuberosities of the patient upon fluid being supplied to said second fluid support means adequate to relieve pressures exerted on patient body portions contacting said first resilient support means;

(c) means associated with said second support means for supplying fluid thereto; and

(d) means associated with said fluid supply means for automatically controlling supply of fluid to and from said second support means for inflating and deflating said second support means according to a predetermined arrangement whereby pressures exerted on affected body portions of a patient residing atop said first and second support means are varied so that the supporting of the patient is alternatingly substantially performed by said normally deflated second fluid support means receiving said ischial tuberosities when said second fluid support means is periodically inflated and by said first resilient support means receiving said body portions proximate said ischial tuberosities when said second fluid support means is deflated, thereby leading to improved blood perfusion thereat;

(e) timer means operatively associated with said means for automatically controlling supply of fluid for periodically

admitting fluid to said second fluid support means according to a predetermined timing sequence only so that said second support means is normally deflated for minimizing surface pressures to the ischial tuberosities of the patient; and

(g) valve means operatively associated with said second fluid support means for regulating said redetermined arrangement of inflation and deflation dependent on the weight of a patient.

4,796,949

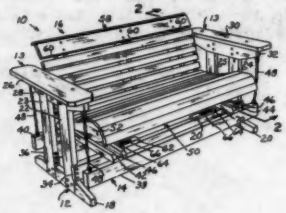
ROCKER/GLIDER

Ted L. Boyce, P.O. Box 130425, Tyler, Tex. 75713

Filed Dec. 28, 1987, Ser. No. 138,181

Int. Cl.[4] A47C *3/02*

U.S. Cl. 297—259 **3 Claims**



1. A rocking glider, comprising

a horizontal base frame including a pair of elongated parallel bars;

upright end frames including horizontal top and bottom bars connected with respective end portions of said parallel bars;

a pair of rails disposed respectively in spaced parallel relation on opposite sides of said parallel bars;

means supporting said pair of rails from said end frames for generally horizontal to and fro movement laterally of said parallel bars;

crossties overlying and transversely interconnecting said rails intermediate their ends, said crossties each having an upwardly open longitudinally extending groove;

seat means including a back mounted on rockers nested in seat means supporting relation by the grooves in said crossties for rocking movement in unison with or independently of the to and fro movement of said pair of rails; and,

chock means slidably supported by said bars and selectively interposed between said bars and said crossties for immobilizing said pair of rails horizontal to and fro movement.

4,796,950

TILT MECHANISM, PARTICULARLY FOR KNEE-TILT CHAIR

Walter C. Mrotz, III, North Muskegon; Donald L. Cool, Holland, and Fred C. Liebertz, Twin Lake, all of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Feb. 9, 1987, Ser. No. 12,573

Int. Cl.[4] A47C *3/00*

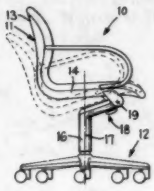
U.S. Cl. 297—302 **18 Claims**

1. In a pedestal-type chair having a base assembly defining thereon a pedestal which projects vertically upwardly in cantilevered fashion, a seat structure having both a seat and a back, the seat being disposed directly above the pedestal so that the latter has its vertical centerline intersecting the seat adjacent the midpoint thereof, and a knee-tilt mechanism connected between the pedestal and seat and defining a substantially horizontally extending tilt axis which extends sidewardly relative to the seat in the vicinity of the front edge thereof for permitting the seat to be tilted downwardly about the tilt axis from a substantially zero-tilt position when the chair is unoccupied through a maximum tilt angle to a lower tilt position when the chair is occupied, said tilt axis being disposed a substantial distance forwardly from and in nonintersecting relationship to the vertical centerline of said pedestal, the improvement wherein said tilt mechanism comprises:

a housing structure mounted on said pedestal adjacent the upper end thereof and projecting forwardly therefrom toward the front edge of said seat, and a support structure secured to said seat and projecting downwardly therefrom adjacent but spaced slightly rearwardly from the front edge thereof, said support and housing structures having opposed parts which are relatively rotatably supported on one another for defining said tilt axis;

first biasing means coacting between said housing and support structures for imposing a restoring torque about said tilt axis which normally urges said seat into said zero-tilt position, said first biasing means including spring means for generating a restoring torque which increases approximately linearly in relationship to the angularity of seat tilt as the seat tilts from the zero-tilt position toward the lower tilt position;

second biasing means coacting between said support and housing structures for imposing a restoring torque about



said tilt axis which continuously urges said seat toward said zero-tilt position, said second biasing means being operatively coupled between said structures in generally parallel relationship with said first biasing means so that said first and second restoring torques add together for urging the seat toward said zero-tilt position;

said second biasing means including a spring unit hingedly supported at one end about a first substantially horizontal pivot axis and lever means hingedly supported at one end about a second substantially horizontal pivot axis which is parallel with but spaced sidewardly from said first pivot axis, one of said first and second pivot axes being coaxially aligned with said tilt axis, and cam means cooperating between the other end of said spring unit and the other end of said lever means for creating said second restoring torque, said cam means including cam follower means associated with the other end of said spring unit, said cam means also including a first elongated cam profile associated with the other end of said lever means and a second elongated cam profile stationarily associated relative to one of said structures, said cam follower means being cooperatively engaged with and captivated between said first and second elongated cam profiles.

4,796,951

AUTOMOTIVE SEAT

Hisao Tamura; Shuichi Tokumitsu, and Yuji Tagawa, all of Kanagawa, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Apr. 25, 1986, Ser. No. 855,621

Claims priority, application Japan, Apr. 27, 1985, 60-91585

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.[4] B60N *1/023*

U.S. Cl. 297—337 **8 Claims**

1. A seat assembly arranged on a floor, comprising a main slide mechanism including two parallel stationary rails

mounted on said floor and two parallel movable rails slidably disposed on said stationary rails, and an auxiliary slide mechanism including a generally rectangular first frame structure mounted on said movable rails to move therewith, a generally rectangular second frame structure slidably disposed on said first frame structure, an operating device for adjusting the position of said second frame structure relative to said first frame structure, a seat cushion mounted on said second frame structure to move therewith and a seatback mounted on said movable rails of the main slide mechanism to move therewith, wherein said operating device comprises:

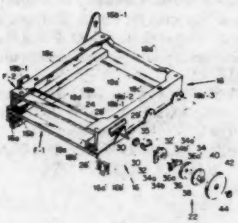
a shaft supported by a given portion of said first frame structure and rotatable about its axis;

a first gear secured to said shaft to rotate therewith;

a rack secured to said second frame structure and meshed with said first gear so that rotation of said shaft about its axis induces a sliding movement of said second frame structure relative to said first frame structure;

a second gear secured to said given portion of the first frame structure;

a lock device rotated together with said shaft and lockingly engageable with said second gear to lock the shaft to the fixed second gear; wherein said lock comprises;



a pawl mounting piece secured to said shaft for rotation therewith and mounted adjacent said second gear; and

a pair of pawls rotatably mounted on said pawl mounting piece, one of said pawls adapted to engaged said second gear so to prevent rotation in one direction and the other of said pawls adapted to engage said second gear so as to prevent rotation of said second gear in the opposite direction and

a lock cancelling device pivotally disposed about said shaft and disengaging said latch device from said second gear when rotated by a given angle about the shaft, wherein said lock cancelling device comprises;

a lock cancelling device pivotally disposed about said shaft and disengaging said latch device from said second gear when rotated by a given angle about the shaft, wherein said lock cancelling device comprises:

a rotation knob rotatably mounted on said shaft; and

a bracket fixedly secured to said rotation knob and having two pins projecting in the axial direction of said shaft, said pins adapted to pass through corresponding slots in said pawl mounting piece and selectively disengage said pawls.

4,796,952

CHAIR WITH HINGED BACKREST

Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy

Filed May 18, 1987, Ser. No. 50,862

Claims priority, application Italy, Jun. 12, 1986, 53523/86[U]

Int. Cl.[4] A47C *3/20*

U.S. Cl. 297—340 **13 Claims**

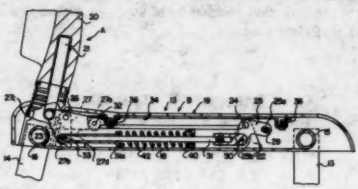
1. A chair comprising a support structure; a seat connected to the support structure by means of a pair of first and second levers having respective first ends hinged to the seat and respective second ends hinged to the support structure, so that the support structure, first and second levers, and seat define a parallelogram system that is able to move the seat between a lowered position and a raised position; and a backrest hinged to the support structure and operationally connected to the seat so as to be able to pivot between an upright position corresponding to the lowered position of the seat and a reclined position corresponding to the raised position of the seat,

characterized in that:

a. the backrest (20) is integral with at least one of the second levers (27);

b. elastic means (42) are associated with the parallelogram system (18, 19, 25, 27) and are designed to hold the backrest (20) elastically in the upright position (A);

c. at least one of the levers (27) has, on the end hinged to the



support structure (12), an arm (27*b*) such that the arm defines with the lever (27) a right-angled lever pivotally mounted on the support structure (12), the elastic means (42) being inserted between the arm (27*b*) and the support structure (12);

d. a rod (31) is hinged to the arm (27*b*) of the right-angled lever, which rod is provided with an annular shoulder (31*a*) facing an associated projection (40) integral with the support structure (12), the elastic means comprises a helical spring (42) coaxial with the rod (31) being arranged between the shoulder (31*a*) and the projection (40) to render the parallelogram system adjustable.

4,796,953

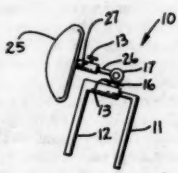
AUTOMOTIVE ADJUSTABLE HEAD & NECK REST

Anthony S. Pereira, 207 Ashurst Ave., Secane, Pa. 19018

Filed Nov. 16, 1987, Ser. No. 121,664

Int. Cl.[4] A47C *7/38*

U.S. Cl. 297—400 **1 Claim**



1. An automobile head rest for use in combination with an automobile seat comprising,

an automobile seat clamp means for securement to an automobile seat including a pair of first "L" shaped portions telescopingly receiving a respective pair of second "L" shaped portions and a bridge member adjustably securing said first pair of "L" shaped portions together;

said bridge member including a single first bridge member telescopingly receivable within a single second bridge member, and

said first "L" shaped portions and said second bridge member each including clamp means for respectively securing said second "L" shaped portions and said first bridge member, and

wherein a padded head support member is telescopingly securable relative to said automotive seat by means of a telescoping link arrangement including a forward link

secured to said automotive head rest telescopingly receiving a rearward link secured to a pivotal positioning means, and

wherein said pivotal positioning means is fixedly secured to said first bridge member, and

wherein said pivotal positioning means comprises first and second interdigited housing members including a spring therebetween to normally bias said first and second housing members in a first lock position, and

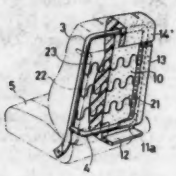
said pivotal positioning means including a manually displaceable plunger to displace said first and second housing members to a second unlock position to enable said pivotal movement of said padded head support means relative to said seat clamp means.

4,796,954

SEAT BACK REAR STRUCTURE

Tetsuo Saito, Tokyo, Japan, assignor to Tachi-S Ltd., Akishima, Japan

Filed Feb. 13, 1987, Ser. No. 14,816
Int. Cl.[4] A47C 7/18
U.S. Cl. 297—452 **4 Claims**



1. A rear structure of a seat back in which a rearwardly curved reinforcing rod member is provided so as to extend between the lower right and left ends of a frame curved in an inverted U-shaped configuration, support members are provided on the right and left of said frame, and cushion member formed of a foam material is applied against said support members, said cushion member being covered by a trim cover assembly which extends the distance from the lower portion of said seat back to the front portion thereof so as to increase the depth dimension of said seat cushion, characterized in that said seat cushion is provided with first and second portions at the outer sides thereof; wherein said first portions extend rearwardly from said seat cushion at the outer side surface of said frame and has ends which are folded over to contact said frame to form a back surface of said seat back; said second portions extend rearwardly from said seat cushion in the area of said reinforcing rod member and have ends which are folded over to contact the rear surface of said reinforcing rod member; and the said second portions being formed thick in said depth dimension around said rearwardly curved reinforcing rod member thereby forming a planar surface with said first portions being the back surface of said seat back.

4,796,955

ELASTIC MEMBRANE SEAT WITH FLUIDIC BLADDER TENSIONING APPARATUS AND METHOD

Jerry K. Williams, Sterling Hts., Mich., assignor to General Motors Corporation, Detroit, Mich.

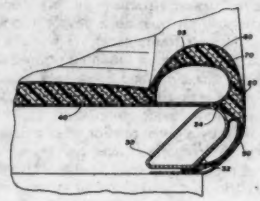
Filed Nov. 4, 1987, Ser. No. 116,575
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 **6 Claims**

1. A vehicle seat, said seat in combination comprising:

a frame with at least two spaced apart members;

a prestretched membrane elastically spanning said spaced apart frame members providing a support surface for said seat and having at least one side portion partially wrapped around at least one of said frame members; and

a selectively inflatable fluid bladder with means of connection to said frame and contacting said membrane beyond said support surface, said bladder being captured between



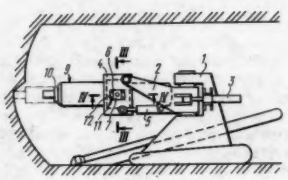
said at least one side portion of said membrane and said frame member whereby the tension of said member is a function of the inflation of said bladder.

4,796,956

MACHINE FOR DRIVING WORKINGS IN HARD ROCKS

Petr Y. Fadeev, Moscow; Vladimir Y. Fadeev; Vladlen V. Korobko, both of Novosibirsk; Rim A. Kulagin, and Nikolai P. Ermilov, both of Novosibirsk, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Gidroimpulsnoi Tekhniki, Novosibirsk, U.S.S.R.

PCT No. PCT/SU85/00064, § 371 Date Mar. 30, 1987, § 102(e) Date Mar. 30, 1987, PCT Pub. No. WO87/00885, PCT Pub. Date Feb. 12, 1987
PCT Filed Jul. 30, 1985, Ser. No. 35,585
Int. Cl.[4] E21C 29/28
U.S. Cl. 299—69 **8 Claims**



1. A machine for driving workings in hard rocks, comprising

a movable carrier;

a swinging boom mounted for rotation in a horizontal plane on said movable carrier;

a frame rotatable in a vertical plane carried at an end of said swinging boom;

an implement mounted on said frame for a limited rotation in horizontal and vertical planes and for a limited axial movement;

a hammer piston extendable from said implement to act directly upon the rock for breaking the rock;

pins mounting said implement in said frame;

support members arranged about said pins to support said pins in said frame so that each of said pins is rotatably received within one of said support members, each of said support members received for sliding within an opening in said frame;

at least two shock-absorbing means;

piston rods of the at least two shock-absorbing means coaxially mounted opposite to each other in the frame, first ends of the piston rods engaging one of said support members;

cylinders within which said piston rods are axially movable for taking up undesired displacements of the implement and for returning the implement to a pre-set position wherein each shock-absorbing means comprises

a casing including an actuator space filled with a compressible fluid under pressure and receiving an end of one of said piston rods, the end being remote from the first end of the piston rod; and

first and second dashpot spaces filled with a non-compressible fluid and provided within said casing, said piston rod preventing fluid communication between said dashpot spaces and said actuator space;

throttling means through which the first and second dashpot spaces communicate with each other;

at least one enlarged piston-like portion on the piston rod acting upon the non-compressible fluid so as to cause it to flow through the throttling means between the first and second dashpot spaces during movement of the piston rod.

4,796,957

VEHICULAR DRIVE CONTROL SYSTEM

Hideo Wakata, Nagoya; Yuzo Imoto, Kariya; Toshihiro Takei, Okazaki, and Yoshiyuki Hattori, Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

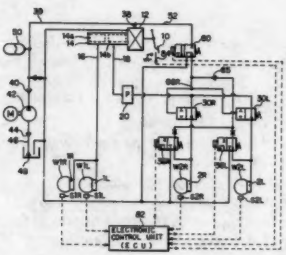
Filed Nov. 18, 1985, Ser. No. 799,166

Claims priority, application Japan, Nov. 20, 1984, 59-245455; Nov. 21, 1984, 59-246757

The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.

Int. Cl.[4] B60T *13/00*

U.S. Cl. 303—116 **6 Claims**



1. A vehicular drive control system including:

a brake system having a reservoir, hydraulic pressure actuated brakes connected to wheels, including driving wheels, on a vehicle, a hydraulic pump for pumping brake fluid from said reservoir, and hydraulic booster means connected to said pump for amplifying a vehicular brake actuating force by using a high hydraulic pressure supplied from said hydraulic pump and applying hydraulic pressure to said brakes to brake said wheels;

electrically-operated change-over valve means connected to said reservoir and said hydraulic pump for outputting a low hydraulic pressure from said reservoir during normal braking and outputting said high hydraulic pressure from said pump during a hydraulic pressure passing state in response to a first control signal;

pressure-operated cut-off valve means controlled by the output of said change-over valve means for applying hydraulic pressure from said booster means to said brakes therethrough in response to said low hydraulic pressure from said changeover valve means during normal braking and preventing said booster means from applying hydraulic pressure to at least said brakes associated with said driving wheels in response to said high hydraulic pressure from said change-over valve means, said cut-off valve means further preventing reverse application of hydraulic pressure from said brakes to said booster means when said high hydraulic pressure is applied from said change-over valve means during said hydraulic pressure passing state;

check valve means connected to said output of said change-over valve means for passing said high hydraulic pressure from said change-over valve means therethrough and preventing reverse flow;

electrically-operated control valve means, connected serially between said brakes and said check valve means and responsive to a second control signal, for selectively applying said high hydraulic pressure from said check valve means to said brakes associated with said driving wheels to selectively brake said driving wheels; and

control means for: (1) detecting acceleration slip of said driving wheels, (2) generating said first control signal to control said change-over valve means to switch said change-over valve means into said hydraulic pressure passing state, and (3) generating said second control signal to control said control valve means according to the state of said detected acceleration slip of said driving wheels so as to control hydraulic pressure being supplied to said brakes of said driving wheels such that acceleration slip does not exceed a predetermined degree.

4,796,958

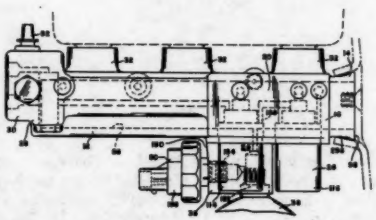
INTEGRATED ANTI-LOCK BRAKING SYSTEM

Arthur K. Brown, Jr., South Bend, Ind., assignor to Allied Signal Inc., Morristown, N.J.

Filed Aug. 26, 1987, Ser. No. 89,459

Int. Cl.[4] B60T *8/06*

U.S. Cl. 303—113 **15 Claims**



1. An integrated anti-lock braking system assembly comprising: an elongated body having a mounting end and an axial bore extending from said mounting end, a master cylinder assembly operatively disposed in said bore, said mounting end including a modulator valve mounting pad having a plurality of modulator valve receptacles therein, the distal end of said body including a valve block having a plurality of valve chambers and an outlet port for each vehicle wheel cylinder therein, brake pressure proportioning valve means and differential pressure valve means being operatively received in corresponding valve chambers, a plurality of primary fluid passages in said body extending in parallel spaced type relationship to said bore, a plurality of secondary fluid passages formed in said body on axes perpendicular to said primary fluid passages to intersect a corresponding one of said bore, primary fluid passages, modulator valve receptacles and valve chambers, to define an anti-lock braking system hydraulic circuit.

4,796,959

BRAKE SYSTEM WITH CONTROL OF BRAKE SLIP AND TRACTION SLIP

Wolfram Seibert, Pfungstadt; Norbert Ocvirk; Guenther Trach, both of Offenbach, and Joachim Maas, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 71,960

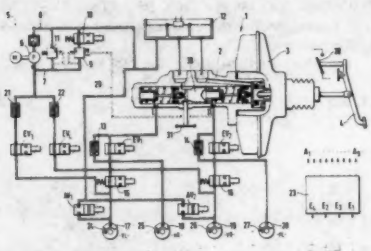
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1986, 3623150

Int. Cl.[4] B60T *8/36, 8/64, 8/34*

U.S. Cl. 303—119 **8 Claims**

1. A brake system for automotive vehicles with control of

brake slip and traction slip, said system comprising an auxiliary-energy-assisted braking pressure generator, two hydraulically separated pressure medium circuits each of which connects one driven wheel and one non-driven wheel with said pressure generator, valve arrangements in pressure medium paths leading from the braking pressure generator and from an auxiliary-pressure-supply system to the wheel brakes and from the wheel brakes to a pressure compensation reservoir, said valve arrangements hydraulically connecting the braking pressure generator with the wheel brakes in one switching position and hydraulically connecting the auxiliary-pressure-supply system instead of the braking pressure generator with the wheel brakes in a second switching position, two separating valves each of which is located in one of said pressure medium circuits between an inlet valve of said valve arrangement and the wheel brakes of the respective pressure medium circuit, and each of which is operative in the traction slip control phase to lock the pressure medium connection to the wheel brakes of



the non-driven vehicle wheels from the auxiliary-pressure-supply system, wheel sensors and electronic circuits for the determination of the rotational behavior of the wheels and for the generation of electric braking pressure control signals by means of which the valve arrangements and the separating valves can be changed over, the separating valves in each brake circuit each comprising a multi-directional valve which is normally open for passage and which connects the two wheel brakes of one brake circuit, said valve arrangements further comprising additional multi-directional valves between the auxiliary-pressure-supply system and the wheel brakes of the driven wheels, said additional multi-directional valves having a first position connecting the auxiliary pressure system and the wheel brakes of the driven wheels and a second position to modify brake pressure and wherein the auxiliary pressure provided by said auxiliary-pressure-supply system is introduced into the braking circuit between aid separating valves and the wheel brakes of the respective driven wheels.

4,796,960

CAROUSEL PORTABLE PANTRY

Rodrigo A. Candelas, P.O. Box 63133, 3725 E. Ramboz Dr., Los Angeles, Calif. 90063

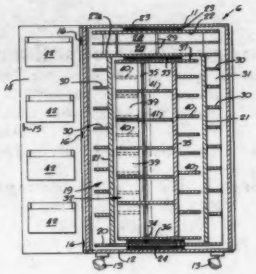
Continuation-in-part of Ser. No. 933,639, Nov. 19, 1986, abandoned. This application Sep. 18, 1987, Ser. No. 98,219
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—305 **4 Claims**

1. A carousel portable pantry for the storage of products including:

a cabinet including a vertical wall, and top and bottom end plates closing said wall and a vertical opening in said wall for access to the interior of said cabinet;

an outer storage cylinder rotatably mounted within said cabinet including a vertical opening therein, said outer storage cylinder including a plurality of vertically spaced shelves radiating outwardly from said cylinder toward said cabinet, and said outer storage cylinder rotatable to present said shelves to said vertical opening in said cabinet for access thereto;

an inner storage cylinder rotatably and concentrically mounted within said outer storage cylinder, said inner cylinder including a vertical opening therein, said inner storage cylinder also including a plurality of vertically spaced shelves rotating extending outwardly from said inner cylinder toward said outer storage cylinder, and a plurality of vertically spaced shelves circular in configuration fitted within said inner cylinder and the spacing of said circular shelves not adopted to correspond with the



horizontal plane of said outwardly extending shelves of said inner storage cylinder; and said inner storage cylinder rotatable to present said outwardly extending shelves and said circular shelves to said vertical opening in said outer storage cylinder for access;

a plurality of turntables interspaced between the cabinet and cylinders at the bottom and top to effect rotation of said outer and inner storage cylinder; and

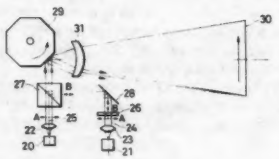
said inner storage cylinder includes a plurality of vertical dividers breaking up the circumferential area of said vertically spaced outwardly extending shelves of said inner cylinder.

4,796,961

MULTI-BEAM SCANNING OPTICAL SYSTEM

Kunio Yamada, and Masao Ito, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,042
Claims priority, application Japan, May 29, 1986, 61-124538
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—6.8 **5 Claims**



1. A multibeam scanning optical system for simultaneous scanning with a plurality of laser beams of a scanning surface, comprising:

a plurality of semiconductor lasers each emitting a beam of laser radiation, said beams of laser radiation having planes of polarization parallel to each other and each of said beams of laser radiation having a major axis perpendicular to its direction of polarization;

means for collimating each of said plurality of laser beams;

means for rotating the polarization direction of at least one of said plurality of laser beams by 90°;

means for arranging said plurality of laser beams such that said beams define a scanning pitch on said scanning surface;

means for directing said plurality of laser beams to the scanning surface; and

means for imaging said arranged beams as beam spots onto said scanning surface.

4,796,962

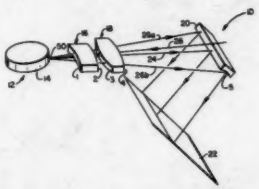
OPTICAL SCANNER

Donald DeJager, and David Kessler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1987, Ser. No. 29,003

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.8 **13 Claims**



1. An optical scanner for scanning a light beam generated by a light source onto a receiving medium, said scanner comprising:

deflector means for scanning said beam through a predetermined angle; and

optical means interposed between said deflector means and said receiving medium, said optical means comprising a pair of spherical lenses and a cylindrical mirror disposed along an optical axis.

4,796,963

SCANNING APPARATUS USING A ROTARY POLYGON MIRROR

Tsuyoshi Yoshimura, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 18, 1987, Ser. No. 86,635

Claims priority, application Japan, Aug. 20, 1986, 61-194176; Aug. 20, 1986, 61-194175

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.8 **7 Claims**

1. A scanning apparatus using a rotary polygon mirror comprising:

a housing including a hollow cylindrical part having a cutout opening;

a rotary polygon mirror being supported by a cylindrical member and being accommodated within said hollow cylindrical part in a state where said cylindrical member is tightly fitted into said hollow cylindrical part;

a motor for driving said rotary polygon mirror;

a noise insulating member mounted on an upper edge surface of said hollow cylindrical part;

an optical lens system accommodated in said housing and arranged in front of said rotary polygon mirror, said optical lens system projecting a laser beam onto said rotary polygon mirror and outputting said laser beam reflected thereby toward a photosensitive drum;

a transparent plate member being fitted into said cutout opening; and

a vibration absorbing member which is attached on an inner wall of said hollow cylindrical part.

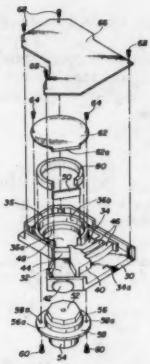
7. A scanning apparatus using a rotary polygon mirror comprising:

a housing including a hollow cylindrical part having a cutout opening;

a rotary polygon mirror being supported by a cylindrical member and being accommodated within said hollow cylindrical part in a state where said cylindrical member is tightly fitted into said hollow cylindrical part;

a motor for driving said rotary polygon mirror;

a noise insulating member mounted on an upper edge surface of said hollow cylindrical part;



an optical lens system accommodated in said housing and arranged in front of said rotary polygon mirror, said optical lens system projecting a laser beam onto said rotary polygon mirror and outputting said laser beam reflected thereby toward a photosensitive drum; and

a transparent plate member being fitted into said cutout opening,

said transparent plate member is inclined by a predetermined inclination angle with respect to an axis of said rotary polygon mirror effective to substantially eliminate noise due to undesirable reflected light.

4,796,964

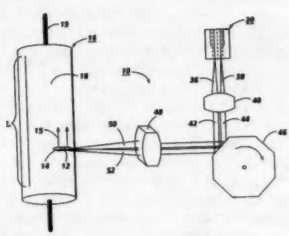
METHOD OF UTILIZING A MULTIPLE EMITTER SOLID STATE LASER IN A RASTER OUTPUT SCANNER (ROS)

G. A. Neville Connell, Cupertino, and Daniel C. Kowalski, Santa Cruz, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1988, Ser. No. 165,700

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.8 **4 Claims**



1. A scanning method utilizing a plurality of output beams without the necessity of beam cross-polarization comprising the steps of

generating a plurality of light beams,

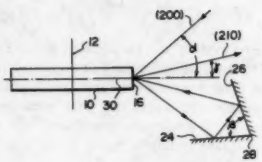
deflecting said beams in a primary scanning direction,
directing said deflected light beams onto a scanning surface,
focusing said light beams to lie substantially along a coordinate axis in a direction substantially orthogonal to said primary scanning direction,
further positioning said light beams so that their focused spots on said scanning surface are overlapped along said coordinate axis,
scanning in overlapped unison a requisite longitudinal region of said scanned surface parallel to said scanning direction with said focused light beams forming a plurality of scan lines,
modulating said light beams to expose positional pixels along said scan lines and
sequentially alternating the operational ON time of said light beams so that no more than one beam is in an ON state at any given time of exposure of the same positional pixels in adjacent scan lines.

4,796,965

OPTICAL SCANNING DEVICE

Hiromi Ishikawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jun. 21, 1985, Ser. No. 747,185
Claims priority, application Japan, Jun. 22, 1984, 59-127322
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **5 Claims**



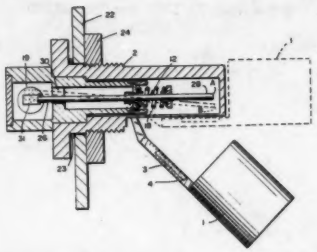
4. An optical scanning device for reducing scanning line distortion, said device comprising: a mechanical type optical deflector provided with a deflecting reflecting surface which can be turned about an axis of rotation, said deflecting reflecting surface being planar and extending in a direction substantially parallel to said axis of rotation, light source means for providing a light beam incident on said deflecting reflecting surface at a first reflection point to provide a reflected light beam, two plane correction mirrors positioned at an angle to each other to define a line of intersection, said plane correction mirrors being positioned to receive said reflected light beam from said first reflection point and to direct the beam to the deflecting reflecting surface at a second reflection point, said plane correction mirrors being disposed in opposition to said deflecting reflecting surface with the line of intersection of the two mirrors extending at a right angle to said axis of rotation, scanning surface means for receiving a scanning light beam from said second reflection point of said deflecting reflecting surface, wherein the incident light beam which falls on the deflecting reflecting surface is reciprocated once between the two plane correction mirrors and the deflecting reflecting surface and is then directed and transmitted to the scanning surface means, said light source means being located on one side of the transmitted scanning light beam and said two plane correction mirrors both being located on an opposite side of the transmitted scanning light beam, said two plane correction mirrors and the angle of incidence of the light beam from said light source means incident on said deflecting reflecting surface being set so that the projection of the scanning light beam from said second reflection point projected on a first plane which is at right-angles to the line of intersection of the two correction mirrors and contains said axis of rotation, forms an angle of from about 5° to about 15° with a line lying in said first plane and perpendicular to said axis of rotation, and said first reflection point and said second reflection point defining a reflection point line on said deflecting reflecting surface, said reflection point line extending parallel to a second plane which is perpendicular to the axis of rotation.

4,796,966

MAGNETICALLY ACTIVATED FIBER OPTIC SWITCH

Joseph G. Kovaleski, 41 Woodward Dr., New Haven, Conn. 06512, and Thomas H. Arms, 44 Fort Hill Ave., Shelton, Conn. 06484

Continuation-in-part of Ser. No. 900,807, Aug. 27, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 122,479
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.2 **17 Claims**



1. A non-electrical switch for regulating passage of light through an optical fiber cable:
a housing
a encasing movement body circumscribed in spaced relation by the housing;
a shaft formed of paramagnetic material, its length describing a first and second section, said first section surrounded by said body and said second section extending outward of said body and the shaft having a longitudinal axis;
at least one optical fiber position adjacent to said movement body at a point remote from an exit point of said first shaft section out of said body;
a paramagnetic element situated outside said housing
the paramagnetic element in spaced, substantially parallel relation with the longitudinal axis of the shaft
a light intercepting surface attached to an end of said first section of said shaft and alienable with an end surface of said optical fiber; and
a spring member communicating with said shaft to return said shaft from an activated position to a rest position whereby said shaft in the at rest position will pivot under influence of sufficient magnetic force toward a paramagnetic element situated outside said body and cause a shift in alignment of the light intercepting surface, the paramagnetic element in spaced parallel relation relation with the longitudinal axis of said shaft.

4,796,967

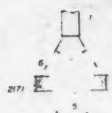
SOLAR RAY ENERGY RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-Ku, Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,099
Claims priority, application Japan, Jan. 16, 1986, 61-6972
Int. Cl.[4] A61N *5/06*
U.S. Cl. 350—96.10 **9 Claims**

1. A solar-ray energy radiation device for the uniform application of solar rays to a localized part of a person's body comprising a cylindrical means having a cylindrical member with a longitudinal axis and a closure part on one longitudinal end of said cylindrical member, said cylindrical member being made of a transparent or a semi-transparent material, an optical conductor having a light-rays emitting end mounted on said

closure part at a position generally aligned with the axis of said cylindrical member such that light rays emitted from said light-rays emitting end of said optical conductor pass into said cylindrical member, said cylindrical member confining the light rays emitted from said light-rays emitting end within said cylindrical member, said light-rays emitting end emitting the blue-colored light ray component of said light rays outwardly toward the cylindrical wall of said cylindrical member, said light rays emitted from said light-rays emitting end being emitted at an angle corresponding to the numerical aperture of said optical conductor such that said blue-colored wave length component of said light rays is concentrated on a cylindrical



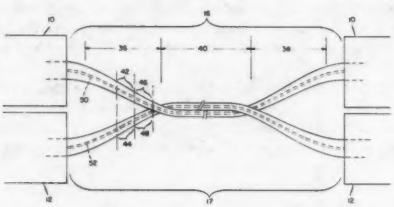
section of said cylindrical member as a result of chromatic aberration, the other longitudinal end of said cylindrical member being open and being adopted to face a part of a person's body to thereby radiate said light rays onto said person's body part, and return means on said cylindrical member operable to return said blue-colored light-ray component generally inwardly toward a central portion of said cylindrical member and onto said person's body part, said return means comprising a cylindrical reflection part disposed at said circumferential section of said cylindrical member, whereby light rays pass from said light-emitting end through the interior of said cylindrical member and are uniformly radiated onto said person's body part facing said open ends of said cylindrical member.

4,796,968

SINGLE-MODE OPTICAL-FIBER DIRECTIONAL COUPLER

Joseph D. Coccoli, Sudbury; John R. Stemniski, Swampscott, and Donato Cardarelli, Westwood, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 2, 1986, Ser. No. 869,315
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 **29 Claims**



19. A single-mode optical-fiber directional coupler comprising:

at least two optical fibers each having a core surrounded by a cladding material and having a region of reduced cladding diameter contiguous with a reduced-cladding-diameter region of the other said fiber throughout the length of an optical interaction area, each said reduced-cladding-diameter region being bounded on each end by a tapered region which gradually increases in diameter as it extends away from said reduced-cladding-diameter region toward a full-diameter region of each said fiber, said optical fibers gently wound about each other without torsional twisting in their reduced-cladding-diameter region;

a substrate;

means, located near each end of said optical interaction area, for securing said reduced-cladding-diameter region to said substrate;

means for supporting said fibers in their full-diameter regions beyond each end of said optical interaction area, said means for supporting circuiting said optical interaction area to define a void encompassing said optical interaction area;

means for fastening said support means to said substrate; and

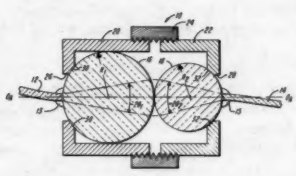
a medium, disposed within said void, surrounding said reduced-diameter regions and having an index of refraction similar to that of the cladding material.

4,796,969

FIBER OPTIC RELAY CONNECTOR

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 809,186, Dec. 16, 1985, abandoned.
This application Apr. 1, 1988, Ser. No. 176,469
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 **3 Claims**



1. A connector for optically coupling a pair of fiber optic elements, said connector comprising a pair of spherical balls with their surfaces in physical contact with one another at a point along an optical axis through their centers, said spherical balls being composed of material that is transparent to radiation at the operating wavelengths of said fiber optic elements, the radii of said spherical balls and the index of refraction of said materials belonging to that set of combinations of radii and indices that provide said spherical balls with the property of imaging one of said fiber optic elements onto the other with their numerical apertures matched when each of said fiber optic elements are respectively in optical contact with the surface of one of said spherical balls at a point thereon opposite said point of contact and along said optical axis to assure that substantially all of the radiation emerging from either fiber optic element is coupled into the other, said indices of refraction and radii of said spherical balls being related by:

$$N_1=2(R_1+R_2)/(R_2+KR_1)$$

to satisfy that one fiber optic element is imaged onto the other and by:

$$T=(R_1N_2)/(R_2N_1)$$

to assure that the numerical apertures of said fiber elements match while said fiber elements are imaged one onto the other where:

R_1 and R_2 are the radii of said spherical balls;

N_1 and N_2 are the indices of refraction of said spherical balls; $K=N_2N_1$; and

T=the ratio of the numerical apertures of said fiber elements.

4,796,970
OPTICAL FIBRE TRANSMISSION LINES

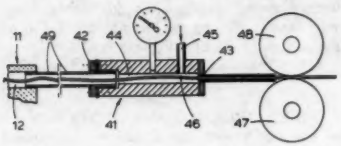
Michael H. Reeve, and Stephen A. Cassidy, both of Ipswich, England, assignors to British Telecommunications plc, London, England

Division of Ser. No. 848,950, Apr. 7, 1986, Pat. No. 4,691,896, which is a continuation of Ser. No. 551,640, Nov. 8, 1983. This application Feb. 13, 1987, Ser. No. 15,113

Claims priority, application United Kingdom, Nov. 8, 1982, 8231840; Apr. 8, 1983, 8309671

Int. Cl.[4] G02B *6/44, 6/00, 6/04*

U.S. Cl. 350—96.23 22 Claims



1. An optical fibre cable structure of extended length L comprising:

a conduit having one or more tubular ductlets of length L disposed therewithin and said ductlets having openings only at either end of said length L and being capable of loosely accommodating at least one optical fibre member, and

at least one optical fibre member inserted into and through an associated ductlet by propelling the fibre member from one end to the other of said ductlet using fluid drag of a gaseous medium distributed along the inserted length of said fibre member.

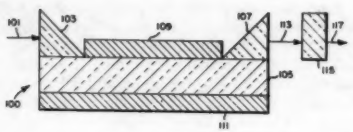
4,796,971
OPTICAL ARTICLE CONTAINING A POLYMERIC MATRIX EXHIBITING A HIGH LEVEL OF SECOND ORDER POLARIZATION SUSCEPTIBILITY

Douglas R. Robello, Webster; Abraham Ulman, and Craig S. Willand, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,886

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.34 20 Claims



1. An optical article containing, for the transmission of electromagnetic radiation, a medium exhibiting a second order polarization susceptibility greater than 10^{-9} electrostatic units comprised of organic polar aligned noncentrosymmetric molecular dipoles having an electron donor moiety linked through a conjugated π bonding system to an electron acceptor moiety to permit oscillation of the molecular dipole between a ground state exhibiting a first dipole moment and an excited state exhibiting a differing dipole moment,

characterized in that the molecular dipoles form repeating units in a crosslinked polymeric matrix.

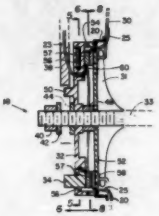
4,796,972
ILLUMINATED SPOKE MOUNTED REFLECTOR FOR BICYCLES

Charles A. Thomas, 632 Gressett St., Petersburg, Va. 23803, and William N. Bland, Jr., 578 Roberson St., Petersburg, Va. 23805

Filed Dec. 24, 1987, Ser. No. 137,561

Int. Cl.[4] G02B *5/12;* B62J *3/00*

U.S. Cl. 350—99 9 Claims



9. An illuminated reflector system for bicycles, each having a frame and a pair of spoked wheels mounted for rotation on said frame by a pair of axles, said system comprising:

means on said frame for supplying an electrical current;

a negative terminal of said electrical current supply means electrically grounded to said frame;

a stationary plate formed from a non-conducting material and having a central aperture for engagement with one of said axles;

a non-conducting carrier ring mounted on said stationary plate for rotation through a limited circular arc;

a pair of diametrically opposed metallic spring contacts carried on said carrier ring;

a pair of circular arc segment metallic contacts mounted on said stationary plate, overlying said carrier ring;

switch means slidably mounted on said stationary plate for selectively rotating said carrier ring and connecting said circular arc segment contacts;

shift cable means secured on said frame for remotely actuating said switch means;

means connecting said circular arc segment contacts with a positive terminal of said electrical current supply means;

a rotary plate formed from a non-conducting material and having a central aperture for engagement with one of said axles;

a rotary carrier ring mounted for rotation on said rotary plate;

a metallic spring contact secured on said rotary carrier ring adapted to engage said circular arc segment contacts mounted on said stationary plate;

spoke clip means on said rotary plate for securing said rotary plate for rotation with one of said wheels;

reflector means including light bulb means mounted on the spokes of at least one of said wheels;

a negative terminal of said light bulb means being electrically grounded to said spoke; and

a positive terminal of said light bulb means connected to said metallic spring contact secured on said rotary carrier ring.

4,796,973

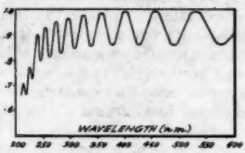
PELLICLE STRUCTURE FOR TRANSMISSION OF MID ULTRAVIOLET LIGHT

Joseph Gordon, Wappingers Falls, N.Y., assignor to Tau Laboratories, Inc., Poughkeepsie, N.Y.

Continuation of Ser. No. 661,577, Oct. 16, 1984, abandoned. This application Sep. 4, 1987, Ser. No. 94,026

Int. Cl.[4] G02B *1/04*

U.S. Cl. 350—1.1 11 Claims



1. A pellicle comprising a thin film of substantially uniform thickness which is tautly fixed to one edge of an enclosed frame, said thin film consisting of cellulose acetate butyrate.

4,796,974

DEVICE FOR FOCUSING ELECTROMAGNETIC WAVES OR SOUND

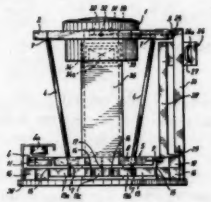
Godefridus J. Brakenhoff, Amsterdam, Netherlands, assignor to Stichting Voor De Technische Wetenschappen, Utrecht, Netherlands

Filed Jan. 19, 1988, Ser. No. 145,606

Claims priority, application Netherlands, Jan. 21, 1987, 8700148

Int. Cl.[4] E02B *7/02*

U.S. Cl. 350—247 11 Claims



1. Device for focusing electromagnetic waves or sound, comprising a focusing element fitted in a holder having two edges which is supported in such a way that moving it in three directions perpendicular to each other (X, Y and Z directions) is possible, while drive units are present to move the holder independently in said three directions, characterized in that the holder rests by means of hinges on at least three legs each having top and bottom ends which at said bottom ends are connected by means of hinges to a structure which can be moved in the Z direction, and that the holder for movement in the X and Y directions is hingedly connected by said two edges which are perpendicular to each other and to a strip which can be moved to and fro by means of said drive units.

4,796,975

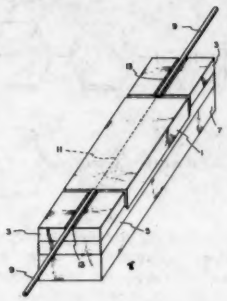
METHOD OF ALIGNING AND ATTACHING OPTICAL FIBERS TO SUBSTRATE OPTICAL WAVEGUIDES AND SUBSTRATE OPTICAL WAVEGUIDE HAVING FIBERS ATTACHED THERETO

Gregory J. Lukas, Lisle; Kevin L. Sweeney, Wheaton, and Michael R. Keur, Niles, all of Ill., assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 14, 1987, Ser. No. 50,254

Int. Cl.[4] G02B *6/00*; B65H *69/02*

U.S. Cl. 350—320 10 Claims



1. A method of aligning and attaching optical fibers to substrate optical waveguides, comprising the steps of:

(a) placing at least one slab of preferentially etchable material and a waveguide substrate face down on an flat surface for aligning the top of the slab with the top of the waveguide substrate and with the slab positioned abutting at least one end of the waveguide on the substrate;

(b) securing said position of said slab and said waveguide substrate by securing a base plate support to the bottom of said slab and waveguide substrate; and

(c) forming a groove in the top surfaces of the slab in a manner wherein said groove is aligned coextensive with the waveguide on said waveguide substrate.

4,796,976

SIDE CHAIN LIQUID CRYSTALLINE POLYMERIC MEDIA EXHIBITING THIRD ORDER NONLINEAR OPTICAL RESPONSE

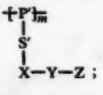
Thomas M. Leslie, Clinton Township; Hyun-Nam Yoon, New Providence; Ronald N. DeMartino, Wayne, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 915,180, Oct. 3, 1986, Pat. No. 4,762,912. This application Oct. 15, 1987, Ser. No. 108,756

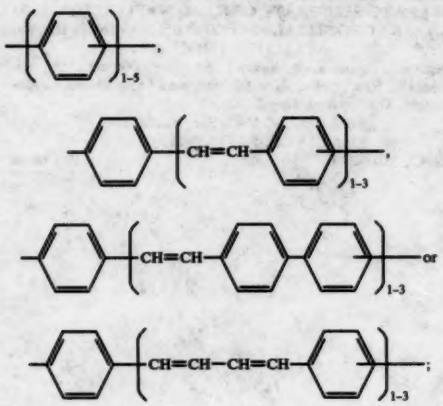
Int. Cl.[4] C09K *19/52*; G02F *1/13*

U.S. Cl. 350—330 3 Claims

1. An optical light switch or light modulator device with a polymeric nonlinear optical component comprising a transparent solid medium of a liquid crystalline polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where P' is a main chain polymer unit; m is an integer of at least 10; S' is a flexible spacer group having a linear chain length of between about 1-25 atoms; X is —NR—, —O— or —S—; R is hydrogen or a C_1–C_4 alkyl group; Y is



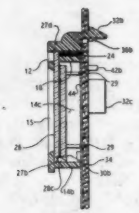
and Z is an electron-donating group or an electron-withdrawing group; and where the polymer has a glass transition temperature above about 40° C.; wherein the transparent nonlinear optical medium exhibits a third order nonlinear optical susceptibility $\chi^{(3)}$ of at least about 1×10^{-11}esu as measured at 1.91 μm excitation wavelength, and the optical medium has an isotropic molecular configuration with macroscopic centrosymmetry.

4,796,977

UNITARY LCD DISPLAY HOLDER

George M. Drake, 8757 Pierpoint Cove, Germantown, Tenn. 38138

Filed Mar. 17, 1987, Ser. No. 26,635
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 R 15 Claims



1. A one-piece display holder for positively locating and removably mounting a visually perceptible display comprising:

(a) an exterior wall having a plurality of opposed side wall portions at the periphery of said one-piece display holder with at least one of said side wall portions having an inwardly projecting lip forming a closed border for retaining the display within said one-piece display holder;

(b) an interior wall extending parallel to a first one of said side wall portions and having a first surface spaced apart from the interior surface of said first side wall portion and defining a recess for receiving an edge-connector means for making electrical connection to a visually perceptible display received in said one-piece display holder;

(c) at least one resilient inwardly projecting element integrally formed in one side wall portion of said one-piece display holder for resiliently urging a visually perceptible display received in said holder against a side wall portion opposed to said side wall portion having said resilient inwardly projecting element formed therein; and

(d) support means for removably mounting said one-piece display holder to a planar surface.

15. The combination of a planar liquid crystal display, a resilient electrical connector formed of a plurality of spaced apart conductive segments, and a display holder comprising:

(i) a unitary holder having side wall portions extending completely around the periphery of said holder with at least one of said side wall portions having an inwardly projecting lip at a first surface thereof;

(ii) an interior wall extending parallel to a first one side wall portion and having a first surface spaced apart from and generally parallel to an interior surface of said first one of said side wall portions defining a recess receiving said resilient electrical connector for making electrical connection to said planar liquid crystal display received in said holder;

(iii) a plurality of resilient inwardly projecting elements integrally formed as a part of said holder in adjacent side wall portions for positively locating said liquid crystal display in said holder; and

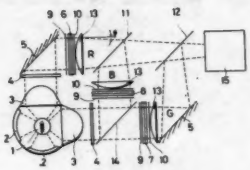
(iv) at least one inwardly projecting step integrally formed as a part of said holder and located on a side wall portion other than said first one of said side wall portions for retaining one edge of said liquid crystal display in said holder such that said planar liquid crystal display is located in said holder generally perpendicularly to said resilient electrical connector.

4,796,978

PROJECTION TYPE LIQUID CRYSTAL DISPLAYING DEVICE

Sakae Tanaka; Tadahiko Yamaoka; Shingo Takahashi, and Tomoaki Takahashi, all of Tokyo, Japan, assignors to Seiko-sha Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,789
Claims priority, application Japan, Jul. 8, 1986, 61-159935
Int. Cl.[4] G02F *1/13;* G02B *5/30*
U.S. Cl. 350—337 1 Claim



1. A projection type liquid crystal displaying device comprising: an optical system for splitting the light emitted from a light source into beams of substantially parallel light of two groups which are orthogonal to each other; a first reflection optical system for reflecting beams of the light of one group at a right angle so that they travel in the same direction as that of the other group; a first liquid crystal panel provided on a light path extending from said first reflection optical system; a first dichroic mirror orthogonally reflecting the light having specified wavelengths among beams of the light of the other group which come from said optical system and admitting the light having other wavelengths; a second liquid crystal panel provided on a light path for the light reflected on said first dichroic mirror; a second dichroic mirror admitting the light which passes through said first liquid crystal panel and reflecting the light which transmits said second liquid crystal panel so as to synthesize beams of such light; a third liquid crystal panel provided on a light path for the light transmitting said first dichroic mirror; a second reflection optical system for reflecting the light transmitting said third liquid crystal panel at a right angle; a third dichroic mirror for synthesizing the re-

flected light from said second reflection optical system with the transmitted light from said second dichroic mirror; and a projection lens system for projecting beams of the light which are synthesized by said third dichroic mirror.

4,796,979

FERROELECTRIC LIQUID CRYSTAL DEVICE HAVING DUAL LAMINATED ALIGNMENT FILMS

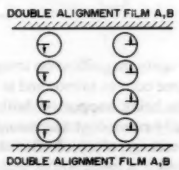
Akira Tsuboyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 33,787

Claims priority, application Japan, Apr. 7, 1986, 61-78285; Apr. 7, 1986, 61-78286

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S 55 Claims



1. A ferroelectric liquid crystal device, comprising: a pair of substrates, and a ferroelectric liquid crystal layer disposed between the substrates; at least one substrate being provided with an alignment control layer, the alignment control layer comprising at least two laminated alignment films of mutually different materials.

17. A ferroelectric liquid crystal device, comprising: a pair of substrates each having an alignment control layer thereof, and a ferroelectric liquid crystal disposed between the substrates; one of the alignment control layers comprising either a single layer of a laminated structure of the following alignment films A and B, and the other of the alignment control layers comprising a laminated structure of the following alignment films A and B:

(A) an alignment film A having a property of orienting the polarization direction of ferroelectric liquid crystal molecules n the vicinity of the alignment control layer toward the alignment control layer, and

(B) an alignment film B having a property of orienting the polarization direction of ferroelectric liquid crystal molecules in the vicinity of the alignment control layer toward the ferroelectric liquid crystal layer:

4,796,980

FERROELECTRIC LIQUID CRYSTAL OPTICAL MODULATION DEVICE WITH REGIONS WITHIN PIXELS TO INITIATE NUCLEATION AND INVERSION

Shuzo Kaneko, Tokyo; Tsutomu Toyono, and Junichiro Kanbe, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

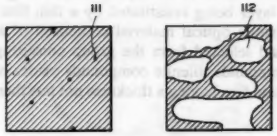
Filed Mar. 27, 1987, Ser. No. 30,569

Claims priority, application Japan, Apr. 2, 1986, 61-075867; Apr. 2, 1986, 61-075868

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S 21 Claims

1. An optical modulation device, comprising: a plurality of pixels arranged two-dimensionally, each pixel comprising a first electrode and a second electrode disposed opposite to each other and an optical modulation material disposed between the first and second electrodes; each pixel having regions with mutually different uniaxial alignment control powers for aligning the optical modulation material.



4,796,981

OPTICAL ELEMENT FOR MODULATION OF LIGHT BY HEATING A MONOMOLECULAR FILM

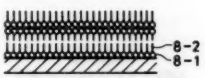
Yukuo Nishimura, Sagamihara; Masahiro Haruta, Funabashi; Yutaka Hirai; Kunihiro Sakai, both of Tokyo, and Hiroshi Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,602

Claims priority, application Japan, Nov. 26, 1983, 58-221431; Nov. 26, 1983, 58-221432; Nov. 26, 1983, 58-221433; Nov. 26, 1983, 58-221434; Dec. 13, 1983, 233656; Dec. 14, 1983, 58-234352; Dec. 15, 1983, 58-234951

Int. Cl.[4] G02F *1/01*

U.S. Cl. 350—353 13 Claims



1. An optical modulation device comprising (a) a substrate, (b) a Langmuir-Blodgett built-up film of a plurality of monomolecular layers each comprising a long chain dialkylammonium salt compound having at least a long chain alkyl hydrophobic moiety and an ammonium hydrophilic moiety, said plurality of monomolecular layers having an interface between adjacent monomolecular layers wherein alternately the ammonium hydrophilic moieties of the long chain dialkylammonium salt compound molecules in adjacent monomolecular layers face each other, and the long chain alkyl hydrophobic moieties of the long chain dialkylammonium salt compound molecules in adjacent monomolecular layers face each other at said interfaces; and the ammonium hydrophilic moieties of the long chain dialkylammonium salt compound molecules face the substrate in the monomolecular later adjacent the substrate, and (c) a heat-generating element for changing a refractive index of said film.

4,796,982

OPTICAL VALVE

Makoto Kitabatake, Katano; Kentaro Setsune, Sakai, and Kiyotaka Wasa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00402, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/02010, PCT Pub. Date May 24, 1984

PCT Filed Nov. 10, 1983, Ser. No. 629,842

Claims priority, application Japan, Nov. 11, 1982, 57-198688

Int. Cl.[4] G02F *1/01*

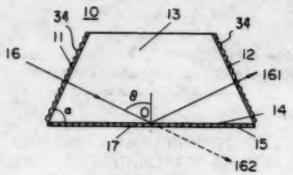
U.S. Cl. 350—356 15 Claims

1. An optical valve for controlling a light beam having a predetermined wavelength, comprising:

a first prism having a predetermined light refractive index, said prism including a light input surface through which said light beam enters said prism, a light output surface

through which said light beam emerges from said prism and a bottom surface;

a light-reflective control layer deposited by sputtering on the bottom surface of said first prism, said light reflective control layer being constituted by a thin film made of a heat-sensitive optical material composed of at least one compound selected from the group consisting of ABO_3 type compounds sillenite compounds oxides of transition metals, said film having a thickness not less than the wave-



length of said light beam, the light refractive index of said light-reflective control layer being lower than the light refractive index of said first prism;

means for thermally controlling the light refractive index of said light reflective control layer; and

means provided on the outer surface of said light-reflective control layer, said means preventing total-reflection of the light beam impinging upon the bottom surface of said prism.

4,796,983

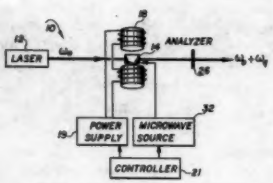
OPTICAL FREQUENCY SHIFTER USING MAGNETOSTATIC WAVES

Daniel D. Stancil, 855 MacArthur Dr., Pittsburgh, Pa. 15228

Filed Jun. 5, 1987, Ser. No. 58,586

Int. Cl.[4] G02F *1/09*

U.S. Cl. 350—376 **9 Claims**



1. A frequency shifter comprising:

means for producing a monochromatic beam of light having frequency ω_o;

means for producing magnetostatic waves having frequency ω_q and wavenumber K_q;

means for varying the magnetostatic wave frequency ω_q while maintaining the magnetostatic wave number K_q; and

means for allowing the magnetostatic waves and the beam of light to interact so light having frequency $\omega_o+\omega_q$ is produced.

4,796,984

OPTICAL IMAGING SYSTEMS

Charles G. Wynne, Hailsham, England, assignor to National Research Development Corporation, London, England

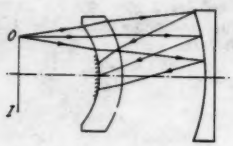
PCT No. PCT/GB87/00348, § 371 Date Jan. 22, 1988, § 102(e) Date Jan. 22, 1988, PCT Pub. No. WO87/07392, PCT Pub. Date Dec. 3, 1987

PCT Filed May 21, 1987, Ser. No. 145,761

Claims priority, application United Kingdom, May 23, 1986, 8612609

Int. Cl.[4] G02B *17/00*

U.S. Cl. 350—444 **5 Claims**



1. A substantially unity magnification image forming system comprising at least one convex mirror and at least one concave mirror, said mirrors being supported with their centres of curvature substantially coincident and means to define a location for an object the image of which after at least three reflections including at least one reflection at each of said mirrors is a real image at a second location characterised in that it comprises a monocentric meniscus lens between said concave and said convex mirrors substantially to give overall correction for Petzval sum, to produce with said meniscus lens at said second location a stigmatic image of an object at said first location.

4,796,985

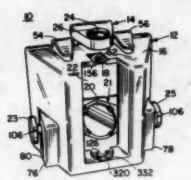
OPTICAL WAVE GUIDE LIGHT COLLECTOR FOR MICROSCOPE

Richard A. Onanian, 85 Irving St., Arlington, Mass. 02174

Continuation-in-part of Ser. No. 16,580, Feb. 19, 1987. This application Mar. 23, 1987, Ser. No. 29,177

Int. Cl.[4] G02B *21/06*

U.S. Cl. 350—523 **18 Claims**



1. A self-contained microscope system for operating in ambient light, comprising:

a base including an integral stage section for holding a specimen to be viewed and an inner cavity having access to an external ambient light source, said stage section defining a stage hole;

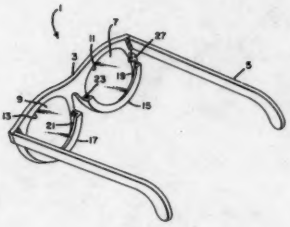
an eyepiece section adjustably mounted to said base for holding a lens, said eyepiece section aligned with said stage hole;

means for finely adjusting the position of said eyepiece section relative to said base to adjust the focus of said lens;

an optical wave guide light collector including a collector element and a light pipe having a first, enlarged end interconnected with said collector element and a second, smaller end for alignment with said stage hole for transmitting the collected light to the specimen being viewed; and

means in said cavity for holding said collector element for disposition in a field of ambient light.

4,796,986
COMBINATION SAFETY GLASSES
Wilford B. Gowdy, Jr., Rt. 1, Box 157, Cades, S.C. 29518
Filed Mar. 14, 1988, Ser. No. 167,724
Int. Cl.[4] G02C *7/08*
U.S. Cl. 351—57 **1 Claim**



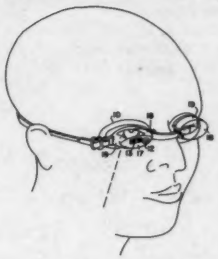
1. Combination safety lenses for detachably mounting, in locked relationship, correcting lenses of the full magnifier, full prescription or full bifocal type to provide for the vision needs of a person wearing safety glasses; said combination safety glasses comprising a frame having lens openings, said lens openings fitting non-correcting safety lenses therein, said lens openings having bottom half portions, said lens openings having, along their said bottom half portions, rearwardly projecting raised portions integral with said lens openings and of one-piece construction, said lens openings and rearwardly projecting portions being in parallel relationship, each of said lens openings and projecting portions forming a continuous channel, said channel defining a guide recess receiving therein and disposing thereby said correcting lens in parallel relationship with its corresponding non-correcting safety lens, each of said raised projecting portions having a nasal-side end and a temporal-side end, said nasal-side end having a nasal-side detent of integral, one-piece construction with its said nasal-side end, said temporal-side end having a temporal-side detent, said temporal-side detent being resilient and having a spring biasing locking action, each of said correcting lenses having a periphery, said periphery having cut therein a nasal-side guide notch and an opposite temporal-side locking notch, said nasal-side detents engaging, in guiding relationship, said nasal-side guide notches, said temporal-side detents cooperating with and engaging said temporal-side locking notches to automatically effect spring-biased removable locking engagements with said temporal-side locking notches.

4,796,987
DIGITAL DISPLAY FOR HEAD MOUNTED PROTECTION
Harry A. Linden, 146 S. Sierra Vista, Santa Barbara, Calif. 93108
Continuation of Ser. No. 683,813, Dec. 20, 1984, abandoned. This application Apr. 7, 1987, Ser. No. 35,219
Int. Cl.[4] G02C *1/00*
U.S. Cl. 351—158 **14 Claims**

1. A headgear comprising:

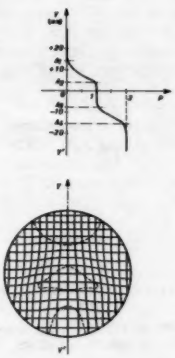
a frame releasably securable to a wearer's head, said frame including a goggle portion for protecting the wearer's eyes from water;

a liquid crystal digital display unit for indicating digital time parameters, said unit being secured to said goggle portion so as to be protected from water, said display unit being light-transmissive so as to permit viewing therethrough by the wearer, said display unit being readable by the wearer against an ambient background; and



control means for controlling said display unit, said control means being accessible by the wearer when said frame is secured to the wearer.

4,796,988
PROGRESSIVE LENS
Maurice Dufour, Paris, and Gerard Obrecht, Issy Les Moulineaux, both of France, assignors to Essilor International Compagnie Generale d'Optique, Creteil, France
Filed Sep. 12, 1986, Ser. No. 906,249
Claims priority, application France, Sep. 13, 1985, 85 13614
Int. Cl.[4] G02C *7/06*
U.S. Cl. 351—169 **2 Claims**



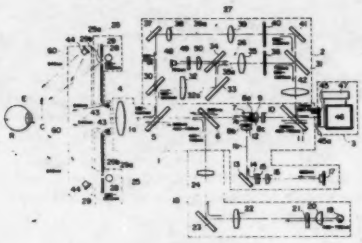
1. Continuous surface progressive lens comprising a substantially constant power first area matched to far vision, a substantially constant power second area matched to near vision, a substantially constant power third area between said first and second areas matched to intermediate vision and respective progressively varying power areas between said first and third areas and between said third and second areas.

4,796,989

OPTHALMOLOGICAL MEASURING APPARATUS

Yasufumi Fukuma; Yoshinori Oana, and Akihiro Arai, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,707
Claims priority, application Japan, Jul. 17, 1986, 61-168825
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—212 4 Claims



1. An ophthalmological measuring apparatus comprising:
(A) projecting means for projecting first and second target images to the retina and cornea of an eye to be tested, respectively;
(B) anterior portion illuminating means for providing illumination to an anterior portion of the eye;
(C) measuring optical means including:
(1) eye refractive power measuring optical means for forming a retina reflected beam of light from said first target image reflected by said retina and projecting said retina reflected beam of light along a first optical path;
(2) corneal configuration measuring optical means for forming a cornea reflected beam of light from said second target image reflected by said cornea and projecting said cornea reflected beam of light along a second optical path; and
(3) anterior portion reflection means for forming an anterior portion reflected beam of light from said illumination reflected by said anterior portion of the eye;
(D) light receiving means for receiving the corneal reflected beam of light, the retina reflected beam of light and the anterior portion reflected beam of light through said measuring optical means at a light receiving surface and generating a cornea image signal, a retina image signal, and an anterior portion image signal, respectively, in response thereto;
(E) image displaying means for displaying an image of an anterior portion of the eye based on said anterior portion image signal from said light receiving means; and
(F) calculating means for calculating a corneal configuration and an eye refractive power of the eye to be tested based on said cornea image signal and said retina image signal, respectively.

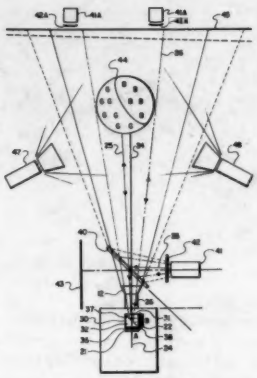
4,796,990

METHOD AND APPARATUS FOR SUPERIMPOSING SCENES

Paul Crothers, 2388 Ontono Cir., Thousand Oaks, Calif. 91362, and Robert Schaffer, 160 Triangle St., Thousand Oaks, Calif. 91360

Filed Jul. 1, 1983, Ser. No. 510,299
Int. Cl.[4] G03B 19/18; A63J 5/00
U.S. Cl. 352—89 12 Claims

1. A method for producing a travelling matte image for combining a foreground object with a background scene comprising:
positioning the foreground object in front of a retro-reflective screen;
illuminating the screen with polarized light;
illuminating the foreground object with general illumination;
receiving in a camera light from the screen and from the foreground object;
dividing the light from the screen and from the object in the camera by directing the light polarized in the manner it is



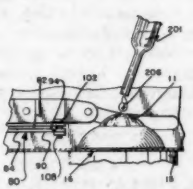
polarized from the screen to a first imaging medium to create a first image of the foregoing object and the screen on the first imaging medium, and directing the light that is not polarized in the manner it is polarized from the screen to a second imaging medium to create a second image of the foreground object and the screen on the second imaging medium.

4,796,991

METHOD AND APPARATUS FOR MEASURING SOFT CONTACT LENSES

Michael D. Gordon, 10225 E. 71st South, Derby, Kans. 67233, and Norris R. Long, 5166 S. Vine, Wichita, Kans. 67217

Filed May 20, 1987, Ser. No. 51,719
Int. Cl.[4] G01B 9/00
U.S. Cl. 356—125 20 Claims



1. A lens holding apparatus used to measure the power of soft contact lenses in conjuction with a lensmeter, comprising:
(a) a basic support housing means;
(b) a lens holder assembly connected to said basic support housing means including a lens support member having a lens support surface to receive a soft contact lens thereon;
(c) a lens conditioner means connected to said basic support housing means and having a lens wiper assembly initially positioned adjacent and out of contact with said lens support surface in a non-use position and selectively engagable with the lens support surface; and
(d) said lens wiper assembly having a wiper blade member which is selectively moved and engaged with said lens

support member to provide a uniform thickness of a fluid solution thereon.

4,796,992

APPARATUS FOR OPTICALLY ANALYZING AN OBJECT USING FOUR-WAVE MIXING TECHNIQUE

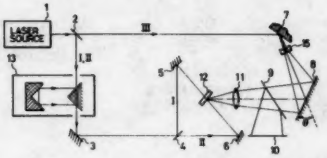
Shinichiro Aoshima, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 10, 1987, Ser. No. 131,404

Claims priority, application Japan, Dec. 11, 1986, 61-293538; Dec. 19, 1986, 61-302912

Int. Cl.[4] G01B 9/027

U.S. Cl. 356—347 **15 Claims**



1. An apparatus for optically analyzing an object using four-wave mixing technique comprising:

a laser source for producing a pulse beam;

a nonlinear optical element for producing a phase conjugate wave according to an incident beam thereon;

a beam splitting means for splitting said pulse beam into first and second pulse beams and guiding said first and second pulse beams to said nonlinear optical element and said object, respectively;

a first guide means for guiding said first pulse beam to enter said nonlinear optical element, said first pulse beam serving as a reference beam and being slit into two beams having the substantially same optical length, one entering said nonlinear optical element from a first direction and the other entering from a second direction opposite to said first direction;

a second guide means for guiding said object beam from said object to enter said nonlinear optical element;

an image observing means for forming an image of said phase conjugate wave from said nonlinear optical element; and

a third guide means for projecting said phase conjugate wave from said nonlinear optical element on said image observing means, wherein said object beam has the substantially same optical length as said reference beam.

4,796,993

PHASE MODULATION TYPE FIBER OPTIC GYROSCOPE

Hisao Sonobe; Junichi Makino, both of Katsuta; Shigeru Oho, Hitachi; Masahiro Matsumoto; Kouji Kitano, both of Hitachi, and Hiroshi Araki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,316

Claims priority, application Japan, Apr. 13, 1987, 62-88825; Jun. 18, 1987, 62-150235

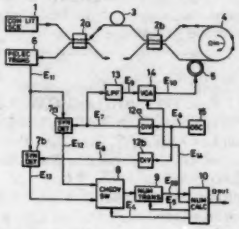
Int. Cl.[4] G01B 9/02

U.S. Cl. 356—350 **7 Claims**

1. A phase modulation type fiber optic gyroscope which has an optical fiber system including an optical phase modulator driven with a modulation signal at a modulation frequency and detects an angular velocity processing an interference signal produced in the optical fiber system, comprising

a number of signal generators which generate said modulation signal and reference signals whose frequencies are identical to said modulation frequency or integer multiplies of said modulation frequency;

a number of synchronous detectors which all have a pair of signal and reference input ports, and all input said interference signal and one of said reference signals as the signal and reference inputs, respectively, and are classified into odd and even groups of the synchronous groups, in which the synchronous detectors of the odd and even groups



sense only the fundamental and odd harmonic components, and only the even harmonic components, respectively, of said modulation frequency from said interference signal with a certain weighting to the fundamental and harmonic frequency components;

a signal processing unit which inputs the output signals from said synchronous detectors and generates said angular velocity processing said output signals from said synchronous detectors.

4,796,994

METHOD AND APPARATUS FOR MEASURING VARIATIONS IN DISTANCES

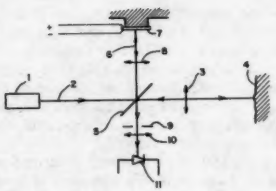
Lars Bager, 54, Vester Faelledvej, DK-1750 Kobenhavn V, Denmark

Filed Aug. 5, 1986, Ser. No. 893,474

Claims priority, application Denmark, Aug. 13, 1985, 3665/85

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—358 **7 Claims**



1. Method for measuring variations in the distance between a point of reference and a surface of an object, said method comprising:

directing a beam emitted from a substantially monochromatic light source onto said surface of said body;

combining in an interferometer light reflected from said surface of said object with a reference beam having a known path and from the same light source to give a combined beam;

converting said combined beam into an electric signal by means of light sensitive means;

effecting a substantially momentary change of the length of the path of said reference beam with a value corresponding to ¼ wave-length of said emitted beam from said monochromatic light source;

converting said electric signal into an output signal in digi-

tized signal processing means for establishing whether a change in sign takes place with respect to a mean value of said electric signal, the same or the opposite sign being applied to the registered variation of the signal if the electrical signal is positive or negative after said momentary change, providing said momentary change is an increase of the length of the path and the opposite application of the sign, if the change is a decrease of the length of the path of said reference beam, said digitized signal processing means comprising means for effecting a continuous processing of the first derivative of the curve of the electric signal, said output signal being an expression for the said variation in distance.

4,796,995

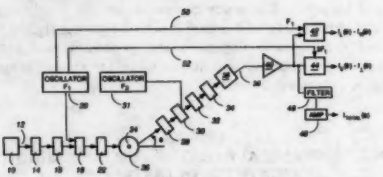
OPTICALLY ACTIVE BIOLOGICAL PARTICLE DISTINGUISHING APPARATUS

Gary C. Salzman, Los Alamos, N. Mex., and Robert H. Kupperman, Washington, D.C., assignors to The United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 815,185, Dec. 23, 1985, abandoned, which is a continuation of Ser. No. 763,894, Aug. 9, 1985, abandoned, which is a continuation of Ser. No. 452,360, Dec. 22, 1982, abandoned. This application Sep. 2, 1987, Ser. No. 93,052

Int. Cl.[4] G01N *21/21*

U.S. Cl. 356—368 **18 Claims**



1. An apparatus for distinguishing microorganisms, pollens, and eukaryotic cell types as single cells in a cell stream, said apparatus comprising:

a source for a continuous light beam of suitable diameter in the infrared to ultraviolet light range;

means for selecting a linearly polarized component from the beam;

first means for optically modulating the linearly polarized component of the beam into left and right circularly polarized components at a single first frequency;

means for shaping the circularly polarized components and for focusing on and passing the left and right circularly polarized components through a flow chamber through which a stream containing the cells to be distinguished can be flowed as individual cells;

means for collecting the circularly polarized components scattered by a cell to be distinguished at least one angle relative to the direction of the continuous light beam, the scattered components being amplitude modulated at said first frequency in accordance with the circular birefringence of the cell and amplitude modulated in accordance with the linear birefringence of the cell at a second frequency, said second frequency being twice said first frequency;

second means for optically modulating the collected scattered beam components at a single third frequency;

means for again linearly and circularly polarizing the modulated scattered beam components;

means for spatially filtering said again polarized modulated scattered beam components;

photodetector means for receiving said spatially filtered amplitude modulated scattered beam components and for generating an output in accordance therewith; and

means for receiving and analyzing the output and for extracting the amplitude modulated components at at most said first frequency and said second frequency at said at least one angle relative to the direction of the continuous light beam to identify microorganisms and eukaryotic cells as individual cells in the cell stream.

4,796,996

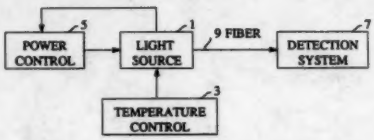
LASER TEMPERATURE MODULATION AND DETECTION METHOD

Matthew J. Burns, Philadelphia, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 14, 1987, Ser. No. 85,448

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—372 **6 Claims**



1. A method of measuring a parameter of a system comprising a semiconductor laser comprising the steps of:

periodically cycling the emission wavelength of said semiconductor laser;

monitoring the optical power from a first face of said laser;

using a feedback control system to maintain said optical power from said first face at a constant level;

emitting light from said laser into an optical cavity which is optically coupled to one face of said semiconductor laser; and

measuring a characteristic of said system.

4,796,997

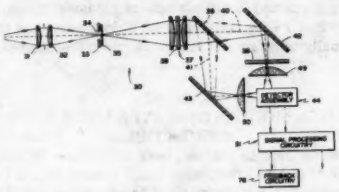
METHOD AND SYSTEM FOR HIGH-SPEED, 3-D IMAGING OF AN OBJECT AT A VISION STATION

Donald J. Svetkoff; Brian Doss, both of Ann Arbor, and David N. Smith, South Lyons, all of Mich., assignors to Synthetic Vision Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 866,735, May 27, 1986, abandoned. This application May 21, 1987, Ser. No. 52,841

Int. Cl.[4] G01B *11/03*

U.S. Cl. 356—376 **31 Claims**



1. A method for the high-speed, 3-D imaging of an object at a vision station to develop dimensional information associated with the object, the method comprising the steps of:

scanning a beam of controlled light at the surface of the object at a first predetermined angle to generate a corresponding reflected light signal;

receiving said reflected light signal at a second angle with a set of optical components;

spatially filtering the received signal;

spatially averaging the received light signal with the set of optical components to compensate for non-uniform intensity distributions in the received signal, said step of aver-

aging including the step of creating a uniform spot of light;

optically splitting the received light signal into first and second split beams, the second split beam being a reference beam;

imaging the first and second split beams to first and second predetermined measuring areas of first and second photodetector means, respectively, to produce corresponding first and second electrical signals proportional to the measurements;

normalizing the first and second electrical signals to lie within a predetermined range; and

computing a centroid value for the first split beam from the normalized signals.

4,796,998

METHOD FOR MOBILE SURVEY OF ROAD SURFACE

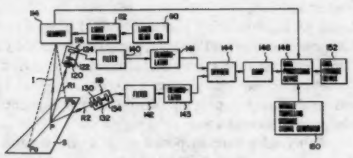
Koroku Soma, Tokyo; Noritsugu Watanabe, Saitama, and Wataru Taniguro, Tokyo, all of Japan, assignors to Pasco Corporation, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,574

Claims priority, application Japan, Oct. 3, 1985, 60-220849; Oct. 21, 1985, 60-234908

Int. Cl.[4] G01B *11/30*

U.S. Cl. 356—376 2 Claims



1. A method of obtaining information of cracks and the like in road surface utilizing a laser beam while a vehicle is travelling in which a road survey apparatus is mounted, said method comprising the steps:

scanning the road surface with a laser beam at right angles to the direction in which the vehicle is travelling, the intensity of said laser beam being modulated with a predetermined frequency prior to the scanning;

receiving the laser beams reflected on said road surface at first and second pickups;

optically filtering the laser beams entering said first and second pickups in a manner to filter out light having frequencies outside of the frequency of the laser beam;

converting the optically filtered laser beams obtained at said first and second pickups into first and second electrical signals, respectively;

electrically band-pass filtering said first and second electrical signals wherein the center frequency of said band pass filtering coincides with said predetermined frequency, and demodulating the electrically filtered first and second signals;

obtaining a ratio of the amplitudes of the demodulated first and second signals, and

comparing said ratio with a predetermined threshold level for obtaining the information of cracks and the like of the road surface.

4,796,999

DEVICE FOR AUTOMATICALLY DETERMINING THE DEVIATION BETWEEN THE STRUCTURES OF A PATTERN AND THOSE OF AN OBJECT COMPARED THEREWITH

Erich Schuster, Huettenberg, and Manfred Kartzow, Wetzlar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

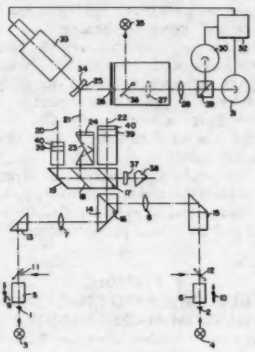
PCT No. PCT/DE86/00157, § 371 Date Jan. 16, 1987, § 102(e) Date Jan. 16, 1987, PCT Pub. No. WO86/07169, PCT Pub. Date Dec. 4, 1986

PCT Filed Apr. 10, 1986, Ser. No. 25,144

Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518043

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—394 11 Claims



1. A device for automatically comparing and determining the deviation between at least two structures, said device comprising:

means for generating an image of each structure to be compared and for guiding the image of each structure along a respective beam path,

means for providing the image of each structure with an identifying polarization characteristic,

means for combining the respective imaging beam paths into a common imaging beam path,

means for coupling out at least one of a visual and television observation beam path from the combined beam path, the coupling means including a face plate with associated polarizing filters inserted in the visual and/or television beam path in order to generate a color representation of the image of each of the structures which corresponds to their respective identifying polarization characteristic,

means for imaging the image of each structure to be compared on a measuring gap to form a superimposed image of the structures on the measuring gap,

means for providing relative movement between the superimposed image of the structures and the measuring gap,

means for splitting radiation passing through the measurement gap into radiation components corresponding to the identifying polarization characteristic of the image of each structure, and imaging the radiation components onto photoelectric detectors,

means for producing signal curves as a function of the relative position of the superimposed image and a measurement gap,

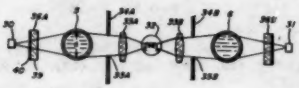
means for evaluating the signal curves with reference to a mutual displacement.

4,797,000

COMPARATIVE COLORIMETER

Richard H. Curtis, Gorham, Me., assignor to Artel, South Windham, Me.

Filed Jan. 2, 1986, Ser. No. 815,522
Int. Cl.[4] C01N *21/53*
U.S. Cl. 356—436 8 Claims



1. An improved optical system for a colorimeter of the type wherein the optical density of a liquid in a cylindrical optically transparent sample tube is determined by passing a beam of light from a light source through the liquid and onto a photodetector, said optical system comprising:

a collimating lens positioned between the sample tube and light source and spaced closer to the light source than the lens transmits a divergent beam to said sample tube;

said sample tube being spaced with respect to the lens so that the outer diameter of said divergent beam at the center plane of said tube is substantially equal to the inner diameter of said tube; and

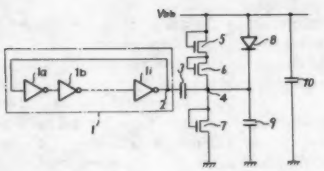
said sample tube acting as a cylinder lens to focus said beam at a vertical focal line and said photodetector being spaced slightly ahead of said focal line so that the beam strikes a substantial portion of said photodetector.

4,797,001

SUBSTRATE BIAS GENERATOR FOR USE IN DYNAMIC RANDOM ACCESS MEMORY

Noriaki Matsumoto; Koichiro Mashiko; Kazutami Arimoto; Kiyohiro Furutani, and Yoshio Matsuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,147
Claims priority, application Japan, Jul. 30, 1986, 61-179740
Int. Cl.[4] G11C *7/00, 7/02;* H01L *27/02;* H03K *3/353*
U.S. Cl. 365—189 2 Claims



1. A substrate bias generator for setting a potential of a semiconductor substrate in a dynamic random access memory and reducing soft errors such as errors caused by alpha ray irradiation, in an IC having insulated gate type field effect transistors (IGFET) as the fundamental elements, said substrate bias generator comprising:

substrate potential generating means provided for generating a substrate potential,

a coupling capacitor connected to an output of said substrate potential generating means,

an IGFET transistor for rectification provided between said coupling capacitor and a ground potential,

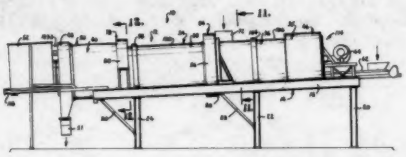
substrate potential control means provided between said coupling capacitor and a substrate potential electrode for controlling the substrate potential to maintain a required level, said substrate potential control means comprising a plurality of IGFET transistors connected in series between said coupling capacitor and said substrate potential electrode.

4,797,002

APPARATUS FOR MIXING ASPHALT COMPOSITIONS

Ronald E. Heap, Kansas City, Mo., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Jun. 23, 1986, Ser. No. 877,120
Int. Cl.[4] B28C *5/46*
U.S. Cl. 366—25 8 Claims



1. A drum mixer for producing an asphaltic composition from asphalt and aggregates, said mixer comprising:

a rotatable cylinder having first and second open ends with an internal passageway communicating therebetween and having first and second zones, said cylinder disposed substantially horizontal with said first end inclined slightly above said second end;

drive means to rotate said cylinder about the central longitudinal axis thereof;

aggregate feed means having a discharge portion extending within said first open end of said cylinder to deliver aggregate material to said first zone of said cylinder;

burner means adjacent said first end of said cylinder to generate a hot gas stream within said first zone of said cylinder in order to heat and dry the aggregate material delivered thereto;

an exhaust tube penetrating the second end of said cylinder and disposed within said internal passageway of said cylinder, said exhaust tube communicating with said first zone to remove said hot gas stream generated by said burner means and thereby prevent said hot gas stream from reaching said second zone;

liquid asphalt feed means disposed within said second zone of said cylinder for delivering liquid asphalt thereto to form an asphaltic composition; and discharge means for directing said asphaltic composition from said second zone of said cylinder.

4,797,003

FOAMED SLURRY GENERATOR

Donald C. Cameron, Tulsa, Okla., and Mat Hoover, Midland, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Apr. 22, 1987, Ser. No. 41,553
Int. Cl.[4] B01F *13/02*
U.S. Cl. 366—101 9 Claims

1. A high pressure foamed slurry generator operatively connected to a tubing string which pumps the slurry into a well, comprising:

a source of liquid;

a source of gas;

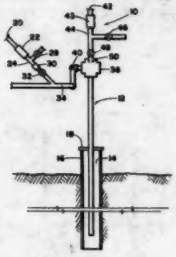
means for combining the liquid and the gas in a manner to form small bubbles of gas substantially uniformly in the liquid;

the means for combining including a housing and a multichannel connector having a mixing area operatively attached to inlets and an outlet in the housing;

one channel of the connector being the inlet for the gas, at least one channel being the inlet for the slurry, and one channel being the outlet for the foamed slurry;

the inlet channel having a means for changing the gas into a

plurality of smaller diameter, higher velocity streams of gas which are combined with the slurry in the mixing area and transported out of the outlet channel, wherein the means for changing the gas into a plurality of smaller



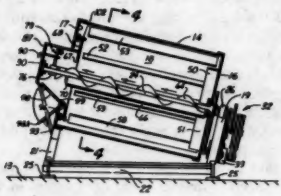
streams includes a bushing operatively connected to the gas inlet channel, the bushing having a plurality of substantially parallel holes through which the gas passes into the slurry, thereby providing a foamed slurry.

4,797,004

MATERIAL MIXER

Floyd E. Buschbom, Long Lake, Minn., assignor to Van Dale Inc., Long Lake, Minn.

Filed Sep. 28, 1987, Ser. No. 101,858
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—186 31 Claims



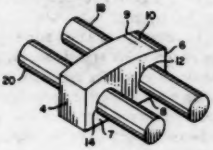
1. An apparatus for mixing materials comprising: a drum having longitudinal axis, an inlet end, a closed end, and a chamber for accommodating materials, housing means for directing materials to the inlet end of the drum for movement into the chamber, means supporting the drum for rotation about the longitudinal axis thereof and inclining the drum and the axis downwardly from the inlet end thereof, conveyor means located in said drum between said inlet end and closed end thereof operable to move mixed material from the closed end into the housing means, drive means for rotating the drum about the longitudinal axis thereof and operating said conveyor means, said conveyor means including open top trough means having a longitudinal axis, and means for moving materials along said trough means, means for angularly moving the trough means about the longitudinal axis thereof between a generally horizontal position to a tilt position, means mounted on the drum for moving materials in said chamber upwardly and allowing said materials to flow into said open top trough means, said means for moving the materials along said trough means operable to move the materials from the trough means back into the chamber when the trough means is in its tilt position and operable to move the materials into the housing means when the trough means is in its generally horizontal position, said housing means having means to allow said materials in the housing means be discharged to a selected location.

4,797,005

DUAL MAGNETIC STIRRING BAR ARRANGEMENT

Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044

Filed Apr. 21, 1988, Ser. No. 184,366
Int. Cl.[4] B01F *13/08*
U.S. Cl. 366—343 7 Claims



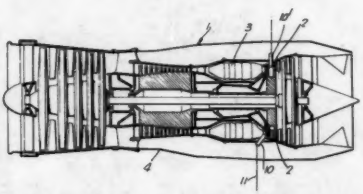
1. A dual magnetic stirring bar arrangement, comprising:
a substantially oblong holder having a pair of oppositely disposed ends; a pair of oppositely disposed sides and a pair of oppositely disposed faces;
a pair of holes extending through the oppositely disposed faces; and
a pair of elongated magnetic stirring bars, each of which is received in force fit relation by a corresponding hole.

4,797,006

PYROMETER SYSTEMS FOR GAS-TURBINE ENGINES

Ronald A. Masom, Southampton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed May 20, 1987, Ser. No. 52,435
Claims priority, application United Kingdom, Jun. 5, 1986, 8613622
Int. Cl.[4] G01J *5/10*
U.S. Cl. 374—130 7 Claims



1. A pyrometer system for providing an indication of the temperature of rotating blades in a gas-turbine engine comprising:
(a) a pyrometer,
(b) means mounting said pyrometer to view the blades to enable said pyrometer to produce an output signal in accordance with the radiation received by the pyrometer in response to thermal emission directly from said blades and also via reflections from said blades but originating with other sources,
(c) processing means, and
(d) means connecting said processing means with said pyrometer to receive said output signal,
(e) said processing means including synchronization means, gating means, and output means, said synchronization means controlling said gating means to interrupt passage to the output means of temperature signals from the engine combustion chamber that occur repetitively between blade emission signals,
whereby passage of the temperature signals from said other sources to said output means is prevented.

2. A method of providing an indication of the temperature of rotating blades in a gas-turbine engine comprising the steps of:

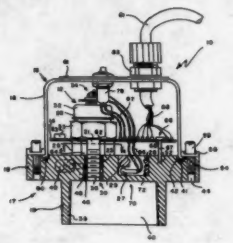
(a) viewing the blades of the engine with a pyrometer to generate signals responsive to the radiation emitted and reflected by the blades,
(b) differentiating the output signals of the pyrometer between those parts thereof arising from emission of radiation from the blades and those parts arising from the reflection by the blades of combustion chamber radiation,
(c) generating gating signals in synchronism with the aforesaid differentiated signals,
(d) interrupting in response to said gating signals the subsequent passage of repetitive signals arising from the reflections of combustion chamber radiation by the blades occurring between each blade emission signal,
(e) and generating an output signal indicative of blade temperature substantially only from the signals responsive to the signals responsive to the temperature of the blades.

4,797,007

TEMPERATURE AND LINE PRESSURE PROBE

John M. Elmore, III, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 18, 1987, Ser. No. 134,974
Int. Cl.[4] G01L 7/00; G01K 1/14
U.S. Cl. 374—143 10 Claims



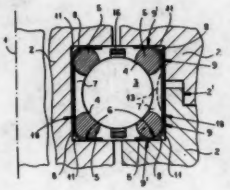
1. A line pressure probe for use on a liquid conduit, said probe comprising:
pressure transducer means of providing an electrical signal representative for the pressure in said liquid conduit, said transducer means including a transducer housing and duct means for transmitting pressure from the liquid in said conduit to the interior of said transducer housing;
a circuit board having circuit components mounted thereon and a hole through it;
a circuit board support;
probe housing means for enclosing said pressure transducer means and said circuit board, said probe housing means including base means for attaching said probe housing means to said liquid conduit, said base means having a channel means through it for communicating with liquid in said conduit; and
securing means for securing said transducer means to said base means;
wherein said circuit board is mounted between said circuit board support and said transducer housing with said duct means passing through said hole in said board and connecting with said channel in said probe housing base means, whereby said securing means also secures said circuit board in said probe housing.

4,797,008

ROLLER BEARING FOR ROTARY OR LINEAR APPLICATIONS

Michael Helbig, Bopfingen, and Heinrich Staudt, Aalen, both of Fed. Rep. of Germany, assignors to Franke & Heydrich KG, Aalen, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 107,692
Int. Cl.[4] F16C 29/04, 33/61
U.S. Cl. 384—49 7 Claims



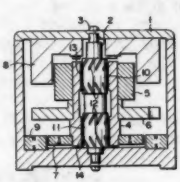
1. A rolling bearing, comprising:
a pair of juxtaposed relatively displaceable bearing members relatively shiftable in a guide direction, separated by a bearing gap extending in said direction, and formed with respective mutually registering bearing grooves;
a pair of race wires received in each of said grooves;
an array of rolling bodies uniformly spaced in said direction rolling upon riding surfaces of said race wires; and
a respective lining strip individual to each of said wires interposed between the respective wire and the respective member, each of said lining strips:
having an inner side turned toward the respective race wire and form-identical to the respective race wire and shaped to form a bed in surface contact with the respective race wire all along the length thereof,
having an outer side forming respective contact surfaces lying in form-fitting engagement with countersurfaces on walls of the respective groove bracing the respective lining strip in two mutually perpendicular directions both of which are perpendicular to said guide direction and which are respectively transverse to and along said bearing gap, and
each of said lining strips in at least one of said grooves being spaced from the other lining strip in said one of said grooves with a selectively variable spacing therebetween.

4,797,009

DYNAMIC PRESSURE AIR BEARING

Mutsuki Yamazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1987, Ser. No. 101,996
Claims priority, application Japan, Sep. 30, 1986, 61-231861
Int. Cl.[4] F16C 32/06
U.S. Cl. 384—100 17 Claims



1. A dynamic pressure air bearing comprising a sleeve member, and a shaft member arranged coaxially in the sleeve member, in which air is introduced through a clearance between the

sleeve member and the shaft member by the rotation of the sleeve member, dynamic pressure of the introduced air acts on a gap in the inner surface of the sleeve member opposite a gap in the surface of the shaft member, and at least one of the inner surface of the sleeve member and the surface of the shaft member is covered with ceramics, the ceramics covering at least one of the inner surface of the sleeve member and the surface of the shaft member comprises at least one element selected from the group consisting of SiN, SiCN, SiO, TiN, TiC, BN, BC, BCN, Al_2O_3, WC, and diamond.

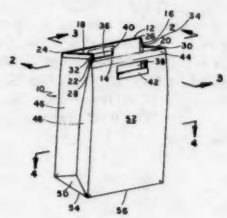
5. A dynamic pressure air bearing comprising a sleeve member, and a shaft member arranged coaxially in the sleeve member, in which said shaft member has an upper dynamic pressure portion and a lower dynamic pressure portion each having a plurality of grooves formed obliquely with respect to the axial direction of the shaft member on the surface of the shaft member, the sleeve member has upper and lower sleeve portions facing the dynamic pressure portions, air is introduced into a clearance between the dynamic pressure portions and the sleeve portions through the grooves, by the rotation of the sleeve member, dynamic pressure of the flowing air acts on the surface of the dynamic pressure portions and the inner surfaces of the sleeve portions, the axial length of the dynamic pressure portions is longer than that of the sleeve portions, at least one of the inner surface of the sleeve member and the surface of the shaft member is covered with ceramics, and said clearance is defined by a gap in the outer shaft surface opposite a gap in the inner sleeve surface, said gaps separating the upper and lower portions.

4,797,010

REHEATABLE, RESEALABLE PACKAGE FOR FRIED FOOD

Urban J. Coelho, Bedminster, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 22, 1987, Ser. No. 101,001
Int. Cl.[4] B65B *25/06*
U.S. Cl. 383—109 **18 Claims**



1. A reheatable, resealable package for fried food, comprising:

(a) an inner grease-absorbent paper layer, wherein said layer is in the shape of a bag having a closed end, an opened end and edges about the opened end;

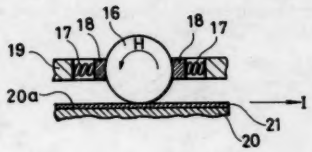
(b) an outer grease-resistant layer, wherein said layer is in the shape of a bag having a closed end, an opened end and an edge about the opened end, wherein said outer layer encloses said inner layer, wherein said layers are connected at the edges about the opened ends and at the closed ends, whereby a layer of insulating air located between the connected edges and the connected closed ends forms between the layers.

4,797,011

SOLID LUBRICANT BEARING

Hiroshi Saeki, Ibaraki, and Teruo Maruyama, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 11, 1988, Ser. No. 141,741
Claims priority, application Japan, Jan. 12, 1987, 62-4358
Int. Cl.[4] F16C *29/04, 33/46*
U.S. Cl. 384—13 **9 Claims**



1. A solid lubricant bearing comprising:

plural rollers disposed in a line or in a circle,

plural solid lubrication elements contacting rolling faces of said rollers,

plural elastic elements respectively for pressing said plural solid lubrication elements on respective rollers,

at least one guiding member having at least one roller receiving face on which said rollers roll, and

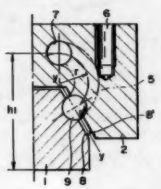
at least one solid lubricant film formed on said roller receiving face.

4,797,012

LINEAR MOTION ROLLING GUIDE UNIT

Kazuhiko Tanaka, Fuchu, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,501
Claims priority, application Japan, Nov. 12, 1987, 62-284200
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 **3 Claims**



1. A compact size linear motion rolling guide unit comprising a track rail member having a generally square cross section, a slidable casing having an inverted U-shaped cross section and straddling said track rail member via a plurality of balls in freely movable relation therewith, side panels fixed onto the longitudinally opposing ends, respectively, of said slidable casing, said track rail member having, on the side surface, a pair of guide grooves for balls, each extending in parallel with the longitudinal axis of said track rail member, said slidable casing having, on the inner surface, a pair of guide grooves for balls in mating relation with a pair of said track rail side guide grooves so that one of the track rail side guide grooves and the mating casing side guide grooves form a load bearing passage for balls between the track rail member and the slidable casing, said slidable casing comprising a pair of ball return passages therewithin, each extending in parallel with said load bearing casing side guide grooves, each of said side panels comprising a pair of direction changing passages each adapted to connect one end of the casing side guide groove with the adjacent end of the ball return passage so that together with the direction changing passage of the opposite end side panel, an endless ball

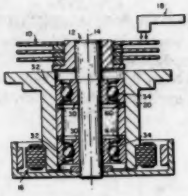
circulating path is formed, wherein in each of said side panels, each of said direction changing passage is so arranged, as seen on a cross section of the unit including a side panel and vertical to the travelling direction of the slidable casing, as to form an arcuate section of a circle having a center that is positioned, in the side panel, on a line passing through the center of a ball present in said load bearing passage and extending in parallel with the related inclined inner side surface of the slidable casing, while each of said ball return passages is formed, within the slidable casing, on the level corresponding to the uppermost part of said direction changing passage as seen in the same cross section mentioned above.

4,797,013

COMPACT FERROFLUIDIC ELECTRICALLY CONDUCTING SEALED BEARING

Kuldip Raj, Merrimack; Hanumaiah L. Gowda, Hudson, and Ronald Moskowitz, Hollis, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Feb. 9, 1987, Ser. No. 12,193
Int. Cl.[4] F16C *33/82*
U.S. Cl. 384—462 **9 Claims**



1. A sealed rolling element bearing for supporting a shaft of magnetic or nonmagnetic material and for permitting rotation of the shaft relative to a housing comprising:

an inner race attachable to the shaft;

an outer race concentric with said inner race and attachable to the housing;

a plurality of rolling elements located in an annular region between said inner race and said outer race;

a pair of shields extending inwardly from said outer race toward said inner race on opposite sides of said rolling elements so as to substantially enclose said annular region, said shields having a closely-spaced, noncontacting relationship with said inner race thereby defining a gap between each of said shields and said inner race,

said inner race, said outer race, said rolling elements and said shields being of magnetically permeable material;

magnetic means for producing a magnetic field in said gaps and in regions where said rolling elements contact said inner race and said outer race; and

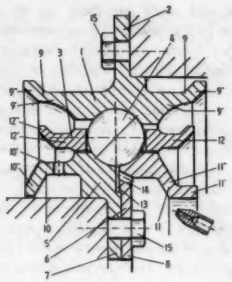
a ferrofluid retained by said magnetic field in the gaps between said shields and said inner race and in the regions where said rolling elements contact said races, said ferrofluid permitting relative rotary movement of said housing and said shaft while sealing opposite ends of said bearing and lubricating said rolling elements; and wherein at least a portion of each of said shields is angled toward said rolling elements and said inner and outer races have equal axial dimensions.

4,797,014

HIGH-SPEED ANTI-FRICTION BEARING PARTICULARLY FOR AIRPLANE POWER PLANTS

Patrick Nicolich, Dittlebrunn, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,519
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 8711624[U]
Int. Cl.[4] F16C *19/06, 33/66, 33/60, 33/46*
U.S. Cl. 384—490 **20 Claims**



1. A high-speed anti-friction bearing comprising an outer ring, an inner ring inward of and spaced from the outer ring, and the rings defining races for rolling elements moving between the rings; rolling elements supported in the races of the rings;

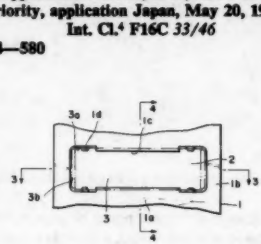
at at least one axial side of the bearing, axially outward of the rolling elements at that one axial side, the inner ring and the outer ring are both provided with respective axial extensions projecting axially outward for strengthening the rings against deformation; each axial extension comprises a generally cylindrically shaped portion and connected thereto an annular portion which is inclined at an angle from the cylindrical portion for generally defining a frustoconical portion.

4,797,015

ROLLER CAGE ASSEMBLY FOR USE IN A BEARING

Kengo Hidano, Fujisawa, and Susumu Amano, Ayase, both of Japan, assignors to Nippon Thomson Co., Ltd., Japan

Continuation of Ser. No. 863,642, May 15, 1986, abandoned.
This application Nov. 20, 1987, Ser. No. 124,331
Claims priority, application Japan, May 20, 1985, 60-106124
Int. Cl.[4] F16C *33/46*
U.S. Cl. 384—580 **8 Claims**



1. A roller-cage assembly for use in a bearing, comprising:

a cylindrical cage including a plurality of axial sections arranged circumferentially and spaced apart from one another and a pair of end sections each connected to one end of each of said plurality of axial sections, each of said axial sections providing a side guide surface at each side thereof and each of said pair of end sections providing an

end guide surface at an inner side thereof, whereby openings are defined between the side guide surfaces of any two adjacent axial sections and said pair of end guide surfaces, each of said axial sections having a central inner portion of an inner surface thereof removed, thereby making said central portion locally thinner than the remaining portion of such of said axial sections in the radial direction of said cage and dividing said side guide surface at each side substantially into a pair of side guide surface portions spaced apart from each other and each located adjacent to a corresponding one of said pair of end sections;

at least one outer projection provided at an outermost location of said guide surface;

at least one inner projection provided at an innermost location of said side guide surface;

a plurality of rollers, each of which is received in a corresponding one of said openings; and

whereby the distance between the side guide surfaces of each of the openings is larger than the diameter of a roller, the distance between the end guide surfaces of each of the openings is larger than the length of a roller, and distances between tip ends of the oppositely disposed outer projections and between oppositely disposed inner projections of an opening are smaller than the diameter of a roller.

4,797,016

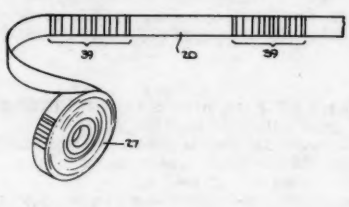
RIBBON INDICIA SYSTEM

Roy J. Lahr, Los Angeles, Calif., assignor to Creative Associates, Los Angeles, Calif.

Continuation of Ser. No. 797,180, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 570,734, Jan. 16, 1989, abandoned. This application Feb. 20, 1987, Ser. No. 18,802

Int. Cl.[4] B41J *31/00*

U.S. Cl. 400—237 **4 Claims**



1. A print ribbon having a start end and a finish end and a longitudinal length representing ribbon footage therebetween comprising:

a flexible substrate having a first side and a second side;

transferable ink deposited on the first side of said flexible substrate;

a plurality of machine-readable marks deposited on the second side of said substrate distributed over the length of said ribbon from said start end to said finish end, each of said plurality of marks being located at a preselected position along the length of said ribbon at a preselected distance from said start end of said ribbon and being spaced from each adjacent mark at a preselected footage interval along the length of said ribbon;

each of said marks being machine-readable information indicating the distance of each said mark from the start end of said ribbon.

4,797,017

WIRE DOT MATRIX PRINTER CAPABLE OF PRINTING LETTERS ON A PLURALITY OF SUPERPOSED SHEETS OF PAPER

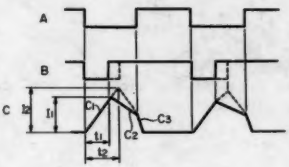
Satoshi Okouchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 24, 1986, Ser. No. 910,968

Claims priority, application Japan, Sep. 27, 1985, 60-213784

Int. Cl.[4] B41J *11/20, 9/38*

U.S. Cl. 400—59 **1 Claim**



1. A wire dot matrix printer for printing letters on a plurality of superposed sheets of paper, comprising:

a printing head including a plurality of solenoids and a plurality of printing wires which are each displaced by a corresponding one of the solenoids;

a platen roller opposed to the printing head;

distance adjusting means for increasing and decreasing the relative distance between the front ends of the printing wires in the printing head and the platen roller, the distance adjusting means including a control lever for adjusting a relative distance between the front ends of the printing wires of the printing head and the platen roller; and

control means cooperable with the distance adjusting means for controlling the drive current to the respective solenoids to continuously adjust the drive current of the solenoids in accordance with the position of the control lever, the control means comprising:

a one-shot monostable multivibrator generating variable-width printing control signals to continuously adjust the drive current of the solenoids, and

a capacitance/resistance circuit including a variable resistor coupled to the one-shot monostable multivibrator and to the control lever such that adjustment of the control lever is operable to adjust the resistance value of the variable resistor to change the pulse width of the printing control signals and adjust the drive current of the solenoids in accordance with the position of the control lever.

4,797,018

RIBBON CASSETTE AND METHOD FOR OPERATING AN ELECTRONICALLY CONTROLLED TYPEWRITER

Norbert Hofmann, Nuremberg, and Rudolf Spotka, Fuerth, both of Fed. Rep. of Germany, assignors to TA Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 105,893

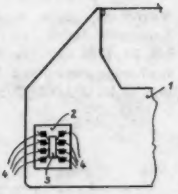
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3718013

Int. Cl.[4] B41J *41/00, 35/30*

U.S. Cl. 400—249 **8 Claims**

1. A ribbon cassette for an electronically controlled typewriter said ribbon cassette comprising an electronic memory equipped with external electronic contacts, said memory being

capable of storing a changeable value corresponding to a respective amount of ribbon left for use in the cassette, and



which stored value can be changed as a result of electrical signals received via said contacts.

4,797,019

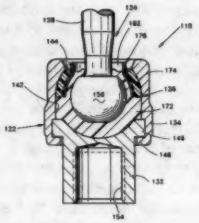
BEARING FOR A JOINT

Ruey E. Wood, Jr., St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Division of Ser. No. 886,232, Jul. 16, 1986, Pat. No. 4,725,159. This application Aug. 28, 1987, Ser. No. 90,784

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—133 **7 Claims**



1. A joint comprising:

a stud including a head portion and a shank portion extending from said head portion;

a socket having a surface defining a chamber in which said head portion is disposed and an opening through which said shank portion extends; and

means for resisting relative pivotal movement of said ball stud and said socket with a first resistance and then a second resistance, said second resistance being greater than said first resistance, said means including a bearing disposed between said stud and said socket comprising:

a first layer of an elastomeric material for exerting said first resistance upon relative pivotal movement of said stud and said socket;

a second layer of another elastomeric material for exerting said second resistance upon a predetermined amount of relative pivotal movement of said stud and said socket; and

a retainer disposed between sid first layer and said second layer, said retainer having a portion engageable by said shank portion upon the predetermined amount of relative pivotal movement of said ball stud and said socket for transmitting movement to said second layer.

4,797,020

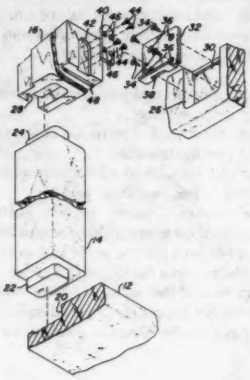
SELF-LOCKING MORTISE AND TENON JOINT

Robert H. Winston, Quakertown, Pa., assignor to Creative Structures, Inc., Quakertown, Pa.

Filed Dec. 7, 1987, Ser. No. 129,667

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—231 **18 Claims**



1. A mortise and tenon joint comprised of two structural members, said first member being positioned at right angles to said second member and having a first mortise cut into the lateral surface which is juxtaposed to said second member with a pocket mortise cut into the rear wall of the first mortise to receive a joint securing plate within the pocket mortise, said joint securing plate having an angled section extending outward along the bottom shoulder of the first mortise, said second member having a mortise cut into the end face facing said first member to receive a tongue plate which, when positioned within the mortise in the end face of the second member, extends beyond the outer dimensions of the end face in a downward direction a distance sufficient to mate and lock with a slot in the outward extending angled section of the joint securing plate in the first member by insertion therein, thereby creating a self-locking joint between the two structural members.

4,797,021

QUICK RELEASE JOINTS AND STRUCTURES INCORPORATING SAME

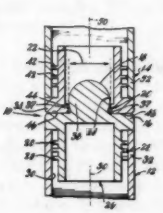
John W. Stamper, The Mounds, 19 Westwood Park Road, Peterborough PE3 6JL, Cambridgeshire, United Kingdom

Filed Mar. 23, 1987, Ser. No. 29,273

Claims priority, application United Kingdom, Apr. 1, 1986, 8607992

Int. Cl.[4] B25G *3/00*; F16B *7/00*

U.S. Cl. 403—407.1 **3 Claims**



1. A structural module such as a shelf or table unit adapted

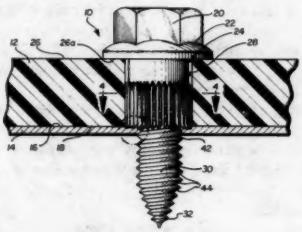
to be connected to a complementary module in directly superimposed and stacked relationship to form a structually integral assembled structure, said module comprising a frame having at least three projecting legs, each of which legs has two opposite ends, each of said legs further having a ball joint means on one of its ends and a socket joint means on the other of its ends, said ball joint means including a first base member and a ball element carried on said first base member, and said socket joint means comprising a second base member having a recess defining a socket element adapted to receive and hold a ball element such as that of said ball joint means, said socket element being sized and shaped to receive a ball element such as that of said ball joint means and to permit such ball element to be inserted in said socket element by applying compression between such joint elements so as to cause resilient deformation of at least one of said joint elements during said insertion followed by retention of such ball element, and said socket element also permitting subsequent withdrawal of such ball element by applying tension between the joint elements, said first and second base members each being formed with a shoulder having an abutment surface, said shoulders engaging the terminal ends of said legs and each of said abutment surfaces being positioned for face-to-face contact with the abutment surface of a complementary joint means on a complementary module when it is part of an assembled joint, said abutment surfaces each being substantially planar and facing generally lengthwise of the axis of insertion of a ball element into a socket element, each of said ball elements projecting outwardly from its associated abutment surface and each of said socket elements being located closely adjacent to its associated abutment surface, the arrangement of said abutment surfaces being such that upon insertion of a ball element into a socket element and retention of the ball element thereby the associated abutment surfaces make face-to-face contact with one another thereby defining the retained position of the ball element relative to the socket element and inhibiting pivotal movement of the involved elements in said retained position, said ball elements on said legs being exposed to view for engagement and connection to complementary socket elements on the opposite ends of the legs of another complementary module, whereby said module can be used individually or assembled with one or more complementary modules to form a structurally integral assembled structure without any modification of its structure.

4,797,022

FASTENER AND FABRICATION METHOD THEREFOR

Edward G. Crigger, Rural Retreat, Va., assignor to Textron Inc., Providence, R.I.

Filed Jan. 9, 1987, Ser. No. 2,304
Int. Cl.[4] F16B *39/282*
U.S. Cl. 403—408.1 **11 Claims**



1. A joint structure comprising in combination: a composite of at least two sheets of material having respective generally planar surfaces in secured engagement, said sheet materials comprising; a first, generally thinner sheet metal or the like, and a second, relatively thicker sheet material; and a fastener securing the composite, said fastener comprising; a threaded shank securely engaged within an aperture formed in said first sheet; a head engaging an exposed surface of said second sheet opposing the engaged surfaces of said first and second sheets; a medial collar formed between said head and said shank, and positioned within a passageway through said second sheet, said collar comprising; a generally cylindrical radially exterior surface; a shoulder formed at an end of the collar joining an end of said shank, said shoulder having an axially exposed, annular face extending radially beyond the joining end of said shank, and a series of teeth extending axially from said annular face and biting into the engaged surface of said first sheet, for increasing the strength of the engagement of the aperture by said shank.

4,797,023

MINE ROOF SUPPORTS

Roy Park, Wigan, England, assignor to Gullick Dobson Limited, Lancashire, England

Filed May 20, 1987, Ser. No. 51,784
Claims priority, application United Kingdom, Jun. 4, 1986, 8613514
Int. Cl.[4] E21D *15/44*
U.S. Cl. 405—291 **6 Claims**

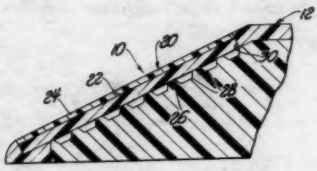
1. A mine roof support, comprising:
a mine floor engaging base having a front, a rear and a longitudinal axis extending from said front to said rear;
a mine roof engaging canopy;
linkage means for pivotally connecting said base and said canopy;
hydraulic jack means for urging said canopy upwardly into load bearing contact with a mine roof, said hydraulic jack means having upper and lower ends;
upper pivotal connection means for permanently pivotally connecting said upper end of said hydraulic jack means to said canopy;
first and second jack receiving means disposed in said base for receiving said lower end of said hydraulic jack means, said second jack receiving means being non-vertically aligned with said upper pivotal connection, said first jack receiving means being spaced from said second jack receiving means in the direction of said longitudinal axis and spaced from said upper pivotal connection by a distance which is shorter than the distance between said upper pivotal connection and said second jack receiving means, said hydraulic jack means being pivotally movable from a first mine roof load bearing position in which said second end is received by said first jack receiving means and said linkage means is in a substantially open configuration to a second transportation position in which said second end is received by said second jack receiving means and said linkage means is in a substantially closed configuration, the space occupied by said mine roof support in said second position being reduced substantially with respect to the space occupied by said mine roof support in said first position, whereby transportation of said support is facilitated.

4,797,024

ABRASIVE RESISTANT PAVEMENT MARKER

Douglas S. Forrer, Heath, Ohio, assignor to Pac-Tec, Inc., Newark, Ohio

Division of Ser. No. 912,521, Sep. 29, 1986, Pat. No. 4,753,548.
This application Feb. 2, 1988, Ser. No. 151,464
Int. Cl.[4] E01F 9/06
U.S. Cl. 404—16 7 Claims



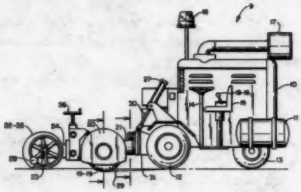
1. A method of making a pavement marker (10) including the step of: forming a lens (20) having a front face (22); adhering and integrally incorporating a photo polymerizable acrylic composition to the lens; and irradiating said coating with ultraviolet or electron beam irradiation to cure said acrylic composition to an abrasion resistant protective hardcoat capable of abrasion resistance while simultaneously retaining reflectivity of the underlying lens.

4,797,025

DEVICE FOR CUTTING A RECEPTACLE IN PAVEMENT TO RECEIVE A REFLECTOR

Ralph Kennedy, Pataskala, Ohio, assignors to Ampsco Corporation, Columbus, Ohio

Filed Mar. 14, 1988, Ser. No. 168,086
Int. Cl.[4] E01C 23/09
U.S. Cl. 404—90 6 Claims



1. A device for cutting a slot in the surface of pavement, said slot being adapted to receive a headlight reflector, comprising

support means positioned on said pavement,

means associated with said support means for moving said support means from place to place,

a rotary cutting means depending from said support means and of a width adapted to cut a slot in the surface of said pavement of a size adapted to receive a headlight reflector,

means on said support means for providing power to operate said rotary cutting means,

means on said support means for raising and lowering said rotary cutting means,

said rotary cutting means being supported on an axis capable of being tilted,

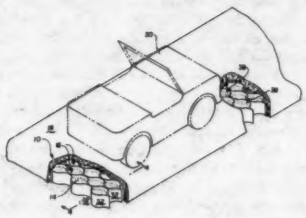
two cams adapted to rotate in engagement with said pavement as said support means is moved, said cams being spaced from each other and positioned on a common shaft and attached to said axis on which said rotary cutting means are supported so that said rotary cutting means performs its cutting function while at right angles to the tangent to that portion of the surface of pavement in which said slot is to be cut and so that the length and longitudinal shape of said slot is determined by said cams.

4,797,026

EXPANDABLE SAND-GRID FOR STABILIZING AN UNDERSURFACE

Steve L. Webster, Vicksburg, Miss., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 608,629, May 9, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 889,025
Int. Cl.[4] E01C 5/20
U.S. Cl. 404—28 59 Claims



1. A structure for providing a trafficable surface comprising:

(a) a grid comprising a plurality of interconnected, flexible upstanding strips of generally constant equal height and generally equal length, each said strip having a top edge and a bottom edge, said bottom edges of said grid strips adapted for only resting on an underlayer whereby said top edges of said grid strip and said bottom edges of said grid strips assume the contour of said underlayer;

(b) said grid having a first collapsed orientation whereby said strips are generally linearly aligned and substantially contiguous and a second expanded orientation whereby said strips are of a generally longitudinal sinusoidal configuration and form a plurality of open ended cells; and

(c) each of said cells being substantially filled with a compacted, granular material, said compacted, granular material providing said trafficable surface.

33. A method of stabilizing an underlayer and providing a support surface, comprising the steps

(a) providing a first expandable grid comprised of a plurality of interconnected flexible strips, said grid having a first collapsed orientation whereby said strips are generally linearly aligned and contiguous and a second expanded orientation whereby said strips provide a number of open ended cells;

(b) supporting said grid in said collapsed orientation only on said underlayer;

(c) expanding said grid to said expanded orientation for thereby providing said number of open ended cells whereby said grid assumes the contour of said underlayer;

(d) substantially filling each of said cells with a granular material; and

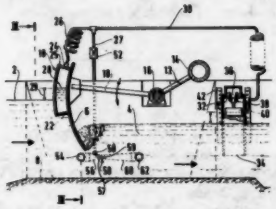
(e) compacting said granular material to form compacted granular material said compacted, granular material providing said support surface.

4,797,027

AUTOMATIC LEVEL-REGULATING SLUICE

Gilles Combes, Grenoble, and Germain Delage, Montbonnot St Martin, both of France, assignors to Alsthom, Paris, France

Filed Jun. 15, 1987, Ser. No. 61,367
Claims priority, application France, Jun. 13, 1986, 86 08560
Int. Cl.[4] F02B 7/20
U.S. Cl. 405—92 7 Claims



1. An automatic level-regulating sluice, comprising:

a plate (6) located in a throat (8) for separating an upstream reach (2) from a downstream reach (4), one of said reaches being a controlled reach whose level is to be maintained, said plate being movable by a motion including a vertical component for closing said throat to a greater or lesser extent to pass a greater or lesser water flowrate, and thereby counteract possible variations in level;

a moving driving caisson (18) whose motion includes a vertical component linked to the vertical component of the plate motion, said caisson having a variable depth thereof immersed in the water in order to receive a variable flotation thrust therefrom;

said caisson having a bottom opening (22) for enabling water (20) to enter into said caisson and occupy a variable depth bottom portion thereof in order to increase the total weight acting on said caisson so that the resulting vertical force of said thrust and said weight may optionally cause said plate to move;

said caisson also having top opening (24) for enabling air to leave the remaining top portion of the caisson and/or to enter said top portion;

said sluice further including a source of low pressure air (50) for setting up a primary pressure reduction relative to the atmosphere;

an air circuit itself including a low pressure feed branch (27) and/or a low pressure exhaust branch (30), with at least one of said branches being controllable in such a manner as to put said top portion (24) into communication with said source and with the atmosphere, in order respectively to cause water to penetrate into said caisson and to cause it to depart therefrom; and

a level sensor (40) sensitive to the difference in level between said controlled reach (4) and a reference level, said sensor controlling said controllable branch (30, 32, 36) in order to apply an effective reduced air pressure to said driving caisson (6), said effective reduced air pressure being a controllable fraction of said low pressure provided by said source, said sensor causing said fraction to vary in a manner which is controlled by the level of said reach and of said reference level;

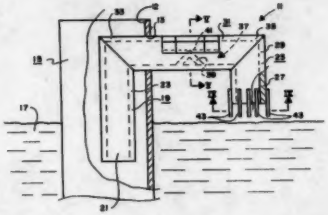
said sluice being characterized by the fact that said low pressure source (50) is a hydraulic suction Venturi, said Venturi comprising a water inlet (54) fed from said upstream reach (2), a converging portion (56), an air suction inlet (58), a diverging portion (60), and a water and air outlet (62) opening out towards said downstream reach (4) in order to cause said primary reduction in air pressure to appear at said suction inlet.

4,797,028

BEAVER CONTROL SIPHON APPARATUS

Robert E. Jamieson, Rte. 4, Box 151, Ripley, Miss. 38663

Filed Jun. 29, 1988, Ser. No. 212,904
Int. Cl.[4] E02B 8/06
U.S. Cl. 405—108 8 Claims



1. A siphon apparatus for hindering beavers from blocking the inlet means of a flood control riser in a water reservoir, said siphon apparatus comprising:

(a) first conduit means for being positioned within said riser, said first conduit means having a lower end and an upper end;

(b) second conduit means for being positioned outside said riser, said second conduit means having a lower end and an upper end, said lower end of said second conduit means being at a higher horizontal plane than said lower end of said first conduit means;

(c) horizontal third conduit means for joining said upper ends of said first and second conduit means and for allowing water to be siphoned from said lower end of said second conduit means to said lower end of said first conduit means;

(d) delay means for preventing the flow of water through said third conduit means until the level of water in said reservoir has risen to a level which allows substantially maximum flow through said siphon apparatus.

4,797,029

REMOTELY INSTALLING A TUBULAR STRING

William S. Cowan, Southside Place, and Edward M. Galle, Jr., Houston, both of Tex., assignors to National Oilwell, Houston, Tex.

Filed Nov. 24, 1986, Ser. No. 934,285
Int. Cl.[4] E21B 7/128; F16L 1/04
U.S. Cl. 405—170 5 Claims

1. A method of remotely connecting a tubular string between a surface facility and a subsea installation wherein the vertical axis of the surface facility is misaligned relative to the vertical axis of the subsea installation, the surface facility including a plurality of spaced underwater guides rings along its vertical axis, comprising the steps of:

lowering a first tubular section from the surface facility to the subsea installation,

connecting the lower end of said first section to the subsea installation,

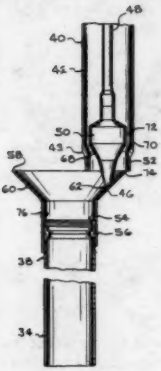
said first section having a length so that its upper end is positioned below the lowermost of the spaced guide rings,

lowering a second tubular section from the surface facility until the lower end of said second section is adjacent to said upper end of said first section,

one of the adjacent ends including guide means,

continue lowering said second section so that said guide

means laterally displaces said adjacent ends into vertical alignment,



connecting said lower end of said second section to said upper end of said first section.

4,797,030

PRECAST CONCRETE CULVERT SYSTEM

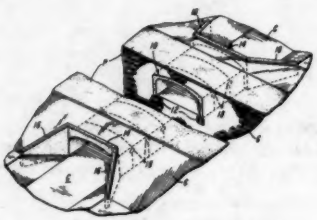
William D. Lockwood, Dayton, Ohio, assignor to Con/Span Culvert Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 853,206, Apr. 17, 1986, Pat. No. 4,687,371, which is a continuation of Ser. No. 566,438, Dec. 28, 1983, Pat. No. 4,595,314. This application Aug. 17, 1987, Ser. No. 86,064

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] E01F *5/00*

U.S. Cl. 405—125 8 Claims



1. A concrete culvert assembly comprising a set of parallel spaced elongated footers, a plurality of precast concrete culvert sections mounted on said footers in longitudinal alignment, each of said culvert sections having an open bottom and including parallel spaced vertical side walls having bottom surfaces resting on said footers, an arcuate top wall integrally connected to each of said side walls of each said section, said side walls of each said section having opposing inner surfaces defining a span greater than the length of said side and top walls, said arcuate top wall of each section having a generally uniform thickness with a curved inner surface having a radius of curvature at least twice the rise defined between the top center of said curved inner surface and said bottom surfaces of said side walls, said radius of curvature being at least twenty feet and said rise being at least five feet, each of said side walls of each said section having a generally uniform thickness and a generally flat vertical outer surface with a vertical height at least sixty percent of said rise and less than fifty percent of said radius of curvature, said concrete top wall of each said section having a curved outer surface forming a relatively sharp corner with said outer surface of each said side wall, reinforcing members embedded in said concrete of each said section and extending generally parallel to said outer surfaces of said top and side walls, and said inner surface of each said side wall and said inner surface of said top wall of each said section being connected by a surface cooperating with said relatively sharp corner to define a corner thickness substantially greater than the uniform thickness of said side and top walls.

4,797,031

CAISSON SINKING METHOD

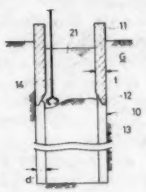
Hakumi Hagimoto; Yutaka Kashima; Norio Kondo, and Masami Inoue, all of Tokyo, Japan, assignors to Daiho Construction Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,540

Claims priority, application Japan, Jun. 6, 1986, 61-132060

Int. Cl.[4] E21D *1/08*

U.S. Cl. 405—133 1 Claim



1. A method of sinking a caisson underground, said method comprising the steps of:

excavating in ground where said caisson is to be sunk a support recess having at least the same shape as the caisson in plan view;

forming said support recess as a ditch made continuously along said shape and down to a caisson sinking position;

forming said support recess to have substantially the same width as a wall thickness of said caisson;

forming said support ditch by sequentially forming trenches reaching down to said caisson sinking position by a method including the steps of:

excavating a first one of said trenches while pouring a high concentration muddy water into excavated part of the trench;

installing a first interlocking pipe at one side end of said trench excavated while casting said bearing material into a remaining part of the trench;

excavating a next trench adjacent to said first trench with said interlocking pipe interposed between them while pouring said muddy water into said next trench being excavated;

installing a second interlocking pipe at one end of said next one of the trenches excavated;

casting said bearing material into a remaining part of the next excavated trench; and

extracting said first interlocking pipe between the first and next ones of the trenches;

casting into said support recess up to the top of the support recess, a bearing material that can carry the caisson but easily collapse by itself;

placing said caisson on said bearing material cast in the support recess as aligned with the case material; and

sequentially removing the bearing material from the support recess to sink the caisson substantially down to the bottom zone of the support recess.

4,797,032

SEALING PROFILE

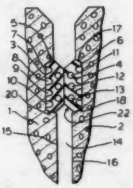
Siegfried Giang, Hamburg, Fed. Rep. of Germany, assignor to Phoenix Aktiengelsellschaft, Harburg, Fed. Rep. of Germany

Continuation of Ser. No. 912,313, Sep. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 865,690, May 22, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,114

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526063

Int. Cl.[4] E21D *11/38;* E04B *1/68;* E16J *15/02*

U.S. Cl. 405—152 10 Claims



1. A sealing profile for sealing segments of a tunnel tube having an edge recess therearound, comprising:

a base section having a substantially planar base surface including from 4 to 6 substantially uniform, laterally and equally spaced-apart parallel grooves, extending in a direction parallel to the longitudinal axis of said profile, and lateral sides extending from said base surface divergently inclined from one another at an angle of from 10 to 20 degrees with respect to a plane perpendicular to said base surface; and

a top section, integral with said base section, having a number of laterally and equally spaced apart parallel ducts equal to one less than the number of said grooves, said ducts extending in a direction parallel to the longitudinal axis of sia profile, said ducts being at least partially laterally displaced with respect to said grooves, the wall thicknesses of the profile material between any of said grooves and ducts all being substantially equal.

4,797,033

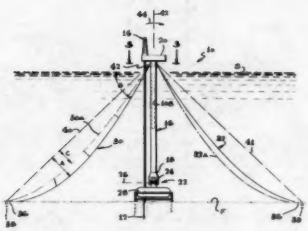
ANCHOR LINE-STABILIZED SYSTEM

Jack Pollack, Reseda, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 137,840, Apr. 7, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,151

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—202 4 Claims



1. An offshore system comprising:

a tower having a lower end lying nearer the sea floor than the sea surface, said tower having an upper end portion lying at a height at least near the sea surface, said tower being tiltable away from a vertical orientation;

a plurality of chain devices having upper ends extending at downward inclines from the upper end portion of the tower and lower ends anchored to the sea floor at locations that are spaced about the lower end of the tower and that are spaced from the lower end of the tower by over 50% of the height of the sea above the sea floor;

means for sensing tilting of said tower;

which means on said tower and coupled to the upper ends of said chain means for selectively pulling on said chain means; and

means responsive to said sensing means for operating said winch means to pull on at least one chain means which lies largely opposite the direction of tower tilting;

each of said chain devices extending in a loose catenary curve wherein the maximum deviation (A) of the chain device from an imaginary straight line extending between the upper end of the chain and the anchor location of the lower end of the chain, is more than 5% of the length of the chain device.

4,797,034

OSCILLATING MARINE PLATFORM WITH A RIGID BASE

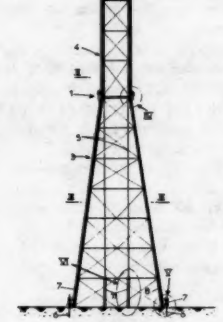
Loic M. J. Danguy des Deserts, Paris; Francois G. Sedillot, Velizy, and Dominique Michel, Paris, all of France, assignors to Doris Engineering, France

Filed Apr. 6, 1987, Ser. No. 34,944

Claims priority, application France, Oct. 24, 1986, 86 14784

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—202 13 Claims



1. An unguyed, free standing, segmented marine platform, for use in deep waters, comprising:

a fully submerged, fixed structure, having a polygonal cross-section and a plurality of substantially vertical legs, the fixed structure being anchored to the sea floor;

a substantially submerged, oscillating structure, positioned vertically above said fixed structure and having a polygonal cross-section and a plurality of substantially vertical legs which are in general vertical alignment with the legs of the fixed structure;

a connection means, for connecting the oscillating structure to the fixed structure, which is comprised of a plurality of flexible piles each having two ends, and of a plurality of pairs of cross structural members,

the flexible piles being arranged on the periphery of the oscillating structure, the one set of ends of the respective piles being fastened to the oscillating structure and the opposing ends of the piles being fastened to the fixed structure,

and the pairs of crossed structural members interconnecting legs of the oscillating structure to non-aligned legs of the

fixed structure, and located in a zone from 30% to 60% of the water depth from water level; and

a submerged floater, positioned on the oscillating structure, having its upper end located in a zone between 1/30 and 1/10 of the water depth from water level.

4,797,035

METHOD OF INSTALLING A TEMPLATE ON THE SEAFLOOR

Andrew F. Hunter, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 5, 1987, Ser. No. 58,488

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—205 **5 Claims**

1. A method for placing a template on the sea floor beneath a floating vessel comprising:

a. securing at least one pendant buoy to said template;

b. securing a tow cable to a first end of said template and a restraining cable to a second end of said template;

c. securing at least one descent sling to a plurality of corners of said template;

d. ballasting said template, as necessary, such that said template is suspended beneath said pendant buoy to avoid interference with said floating vessel;

e. reeling in said tow cable and unreeling said restraining cable to move said template to a position generally centered beneath said floating vessel;

f. connecting an extendable support means to said at least one descent sling;

g. disconnecting said tow cable, said restraining cable and said at least one pendant buoy;

h. lowering said template to the ocean floor using said extendable support means.

4,797,036

MARINE TETHER ANCHORING DEVICE

Roger J. Collins, Botley, and James R. T. Hodgson, Eastleigh, both of United Kingdom, assignors to Brown & Root Vickers Technology, London, England

Filed Dec. 28, 1987, Ser. No. 137,931

Claims priority, application United Kingdom, Jan. 12, 1987, 8700579

Int. Cl.[4] E02D *5/74*; B63B *21/50*

U.S. Cl. 105—224 **9 Claims**

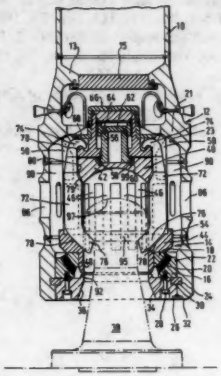
1. A marine tether anchoring device comprising in combination;

a tubular anchor body for eventual attachment at its upper end below a marine tether;

a spigot for eventual fixing to the sea bed so as to be upstanding therefrom and for reception in the anchor body to establish the anchor;

latching means within the anchor body for establishing a releaseable connection to the spigot; and

flexjoint means supported within the tubular body for transmitting tensile load in the anchor body as an inwardly and upwardly directed compressive load through the latching means to the spigot whilst permitting relative tilting



movement between the latching means and the anchor body consequent upon sway of the tether.

4,797,037

PILING

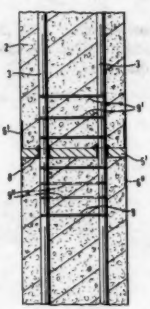
Lee P. Hong, Kuala Lumpur, Malaysia, assignor to Pilecon Engineering Berhad, Kuala Lumpur, Malaysia

Filed Apr. 29, 1987, Ser. No. 43,725

Claims priority, application United Kingdom, Apr. 30, 1986, 8610617

Int. Cl.[4] E02D *5/30*

U.S. Cl. 405—255 **10 Claims**



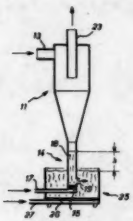
1. A reinforced, pre-cast concrete pile including pile end reinforcing metal end caps, reinforcing means cast into and reinforcing said pile and extending substantially the length of said pile, and a metal member attached to said reinforcing means and cast into said pile, extending in the pile transversely of the pile at a location remote from ends of the pile and formed as a plate element able to act as a metal end cap of a truncated pile formed by cutting the pile immediately below said metal member.

4,797,038

POWDER RECOVERY METHOD AND DEVICE

Jean-Yves Correard, Saint Martin d'Heres, France, assignor to SAMES S.A., Meylan, France

Filed Aug. 20, 1986, Ser. No. 898,382
Claims priority, application France, Aug. 22, 1985, 85 12613
Int. Cl.[4] B65G 53/38
U.S. Cl. 406—138 21 Claims



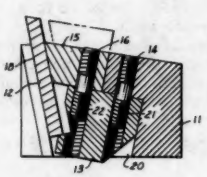
1. A powder recovery system comprising means for processing powder, a receptacle adapted to receive said powder, a substantially vertical column, said substantially vertical column comprising means for permanently and directly fluidically communicating said powder processing means with said receptacle, and means for fluidizing at least said powder located within said column, wherein said receptacle is at atmospheric pressure and said powder processing means is at a pressure different from atmospheric pressure, wherein powder is maintained within said column.

4,797,039

CUTTING TOOL BIT SUPPORT

Ronald P. Bosek, Davisburg, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Sep. 23, 1987, Ser. No. 102,063
Int. Cl.[4] B23P 15/28
U.S. Cl. 407—87 11 Claims



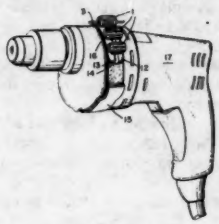
2. Cutting tool bit support comprising a body, tool bit tool bit mounting reaction surface means in said body accommodating linear tool bit adjustment, said surface means including linear beveled tool bit side engaging reaction surfaces, a tool bit adjustably engaging said beveled side surface means having a projecting cutting edge, a jack recess in said body accommodating linear jack adjustment, a jack engaging said tool bit, a first differential screw means engaging differential screw threads in said respective body and jack to effect said jack and tool bit projection adjustment, a wedge clamp having angular surfaces engageable with matching surfaces of said tool bit and said body, and a second differential screw means engaging differential screw threads in said respective wedge clamp and and jack to effect clamping engagement of said tool bit in adjusted position.

4,797,040

STRAP ON DRILL PARAPHERNALIA HOLDING SYSTEM (DPHS)

Bruce A. Hibbard, Los Angeles, Calif., assignor to H-Tech, Inc., Sherman Oaks, Calif.

Filed Feb. 2, 1987, Ser. No. 9,946
Int. Cl.[4] B23B 45/00
U.S. Cl. 408—241 R 3 Claims



1. A holding device for storing drill bits or drill accessories upon a drill body, comprising:

(a) an adjustable circular strap consisting of an elastic portion and a fastening device to fasten one end of said strap to another portion of said strap, said elastic portion being stretched when said strap is placed on the drill body to securely locate the strap on the drill;

(b) a pad which will fasten to the strap;

(c) a means to fasten the pad to the strap;

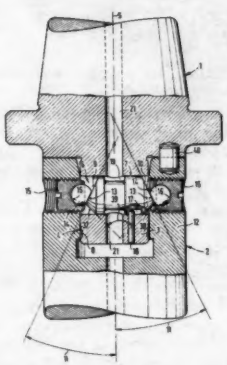
(d) a plurality of sleeves having means to connect the sleeves to the front of the pad, each sleeve having a plurality of axially spaced, flexible ribs extending radially inward from the inner circumference of the sleeve such that a drill bit may be removably inserted into the sleeve and be held by the ribs until the bit is removed for use.

4,797,041

CHUCK

Franz Glaser, Nuremberg, Fed. Rep. of Germany, assignor to Hertel AG Werkzeuge & Hartstoffe, Fürth, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,151
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644091; May 20, 1987, 3716932; Oct. 14, 1987, 3734699
Int. Cl.[4] B23C 1/00
U.S. Cl. 409—232 27 Claims



1. A chuck for clamping tools (1) into a carrier (2) particu-

larly in a revolving head or into the drive spindle of a machine tool,

wherein the tool (1) has a rearward shank (3) which is inserted into a mating bore (4) in the carrier (2), with said bore being surrounded by an annular flange (12) and including the system axis (5) as the bore axis and said shank is fixable therein by means of blocking members, for which purpose a locking element (7) is provided whose frontal ends have sloped faces (9, 10) and which is mounted in a continuous, radial, transverse recess (6) of the shank (3) so as to be radially displaceable therein; said two sloped faces (9, 10)

form an acute angle (11) with the system axis (5), said angle closing in the direction toward the tool (1) to be clamped in; and

are charged for clamping by balls (14) which are held at an annular flange (12) so as to be non-displaceable in the axial direction but radially movable, characterized in that

a planar truncation surface (13) of each ball (14) charges the slopes (9, 10) of the locking element (7) with each ball being rotatably supported in a ball seat (16), with at least one ball (14) being disposed at the frontal end of a pressure screw (15) which is screwed from the exterior radially through the annular flange (12) and is there held captive (FIGS. 1, 2).

4,797,042

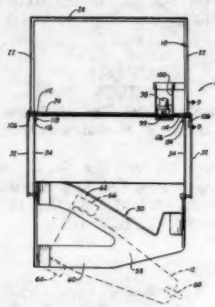
WHEELCHAIR LOADING APPARATUS

Robert E. McFarland, 8301 Northwest 39th Expressway, Bethany, Okla. 73008

Division of Ser. No. 761,427, Aug. 1, 1985, Pat. No. 4,671,729. This application Jun. 1, 1987, Ser. No. 57,101

Int. Cl.[4] B60P *3/06, 7/06*

U.S. Cl. 410—3 **16 Claims**



1. A loading platform for a scooter-type wheelchair comprising:

a substantially horizontal track upon which rear wheels of said wheelchair may be rolled;

a vertical shaft positioned adjacent said track;

a horizontal shaft pivotally attached to said vertical shaft;

a positioning plate for receiving a forward wheel of said wheelchair, said positioning plate pivotally attached to said horizontal shaft and having a tilted loading position and a substantially horizontal loaded position.

8. A loading platform for a scooter-type wheelchair comprising:

a substantially V-shaped track comprising:

a leg portion generally forming a side of said platform; and

another leg portion extending angularly from the first-mentioned leg portion such that said wheelchair may be rolled onto said track from said side of said platform and located in a loading position thereon;

rear wheel location means for locating said rear wheels of said wheelchair in said loading position on said track; and

front wheel location means for locating a front wheel of said wheelchair in said loading position on said track.

4,797,043

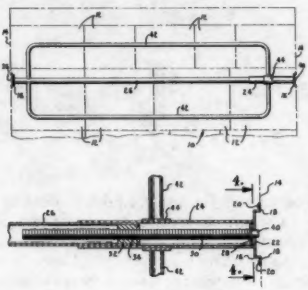
LOAD SHORING BEAM FOR CARGO TRUCKS

John J. Williams, Jr., 9543 Horton, Overland Park, Kans. 66212

Filed Nov. 23, 1987, Ser. No. 123,716

Int. Cl.[4] B60P *7/08*

U.S. Cl. 410—145 **13 Claims**



1. A load shoring beam for restraining cargo in a truck body having opposite side walls provided with track openings, said shoring beam comprising:

a tube assembly comprising first and second cylindrical tubes fitting together telescopically to permit telescopic extension and retraction thereof to respectively lengthen and shorten the tube assembly, each tube presenting on an outer end thereof a tip having a size and shape to enter the track openings;

an internally threaded nut secured in said first tube;

an externally threaded screw secured in said second tube and extending through said nut in threaded engagement therewith, said tubes being rotatable relative to one another in opposite directions to lengthen and shorten the tube assembly, thereby permitting the tube assembly to be extended between the opposite side walls with said tips in the track openings and tightened by threaded action effected by relative rotation of the tubes in a direction to lengthen the tube assembly;

a sleeve fitted on said second tube for rotation thereon; and

a pair of C-shaped hoops on the tube assembly, each hoop having opposite ends one of which is connected with said first tube and the other of which is connected with said sleeve.

4,797,044

IMPROVEMENTS INTRODUCED IN THE ANCHORING SYSTEMS BY MEANS OF THREADED BOLTS

Vincente S. Velasco, Canillas 93 4°-a, Madrid, Spain

Filed Oct. 30, 1986, Ser. No. 926,401

Claims priority, application Spain, Oct. 31, 1985, 548461; European Pat. Off., Oct. 27, 1986, 86500001.2

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—51 **26 Claims**

1. An anchoring device for mooring a mounting element in a mounting hole with an undercut in a substrate, the device comprising:

an elongated mounting element having a stud portion, a neck portion diametrically smaller than said stud portion and extending axially therefrom so as to form a transition edge portion therebetween, and a trunk-conical head portion having a base diametrically wider than said neck and a head end diametrically smaller than said base, said head

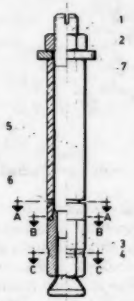
portion extending axially from said neck and having a trunk-conical shape;

a sleeve slidably mounted on said stud portion, said sleeve having a lower edge;

means for preventing said sleeve from axially moving together with said mounting element in a direction in which said mounting element is being withdrawn out of the hole;

a plurality of bushing members axially positionable simultaneously on said neck and head portions, said bushing members engaging said lower edge of said sleeve so that an end portion of said bushing members is between said sleeve and said mounting element, said members having an external surface with a perimetrical groove; and

means for holding said mounting element and said sleeve against each other to thereby hinder said mounting element and said bushing members from axially sliding relative to each other and including elastic means and a perimetral slot in said sleeve accomodating said elastic means therein, said mounting element being axially slidable relative to said sleeve from a fully extended position, in which said bushing members are against said neck but not yet against said trunk-conical head portion, to a withdrawn position, in which said bushing members are against said trunk conical-head portion to thereby obtusely bend outward against the undercut of the hole at an angle equal to that of a conicity of said trunk-conical head portion and said neck portion is opposite said elastic means so that said elastic means elastically closes onto said neck portion to wedge between said transition edge portion and said perimetral slot of said sleeve and thereby hinders said mounting element and said bushing members from axially sliding relative to each other.



4,797,045

FORMATION OF A SCREW THREAD IN MOUNTING HOLES IN FURNITURE HARDWARE MADE OF SHEET METAL

Karl Lautenschläger, Jr., Reinheim, and Gerhard Lautenschläger, Brensbach 1-Wersau, both of Fed. Rep. of Germany, assignors to Karl Lautenschlager GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

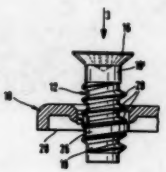
Filed Jun. 30, 1987, Ser. No. 68,897

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1986, 3622001

Int. Cl.[4] F16B *39/00, 37/12*

U.S. Cl. 411—107 **6 Claims**

1. In combination: a piece of furniture hardware of relatively thin stamped and pressed sheet metal, having a section defining a mounting hole; and a mounting screw extending through the mounting hole; said screw having a head, a shaft with a thread, and adjacent the head a thread-less portion with a diameter smaller than that of the thread, the thickness of the sheet metal section being the same or slightly greater than the spacing between two adjacent turns of the thread measured at a central diameter of the thread, the mounting hole having a free cross section which is smaller than the outer diameter of the thread, the sheet metal section being annular, and having a thread extending continuously over more than 180° up to a maximum of 360°, with a pitch corresponding to that of the thread of the mounting screw, a portion of the annular section being cut free from the surrounding sheet metal along an arcuate boundary line; whereby the thread in the mounting hole is sufficient to pre-set the mounting screw, but upon screwing of the mounting screw into a bore in a piece of furniture the annular section is free of the thread of the mounting screw and surrounds the thread-less section and the head presses the furniture hardware against the piece of furniture.



4,797,046

FASTENING UNIT WITH NAIL ANCHORAGE

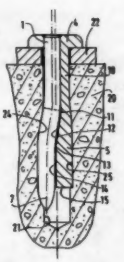
Jean Ollivier, Valence, and Jean-Paul Barthomeuf, Alixan, both of France, assignors to Societe de Prospection et D'Inventions Techniques (S.P.I.T.), Paris, France

Filed Dec. 15, 1987, Ser. No. 132,394

Claims priority, application France, Dec. 16, 1986, 86 17552

Int. Cl.[4] F16B *15/00, 13/04*

U.S. Cl. 411—448 **1 Claim**

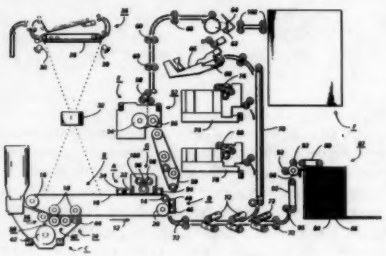


1. A fastening unit adapted to anchor a part to a wall or ceiling structure having a cylindrical bore defined therein, said unit comprising a nail guide member receivable snugly within said bore and a nail receivable within said guide member, said nail guide member having, in axially successive relation, an elongated opening for receiving said nail, an outwardly slanted nail guide portion, an axially extending guide surface, and terminating in an end surface spaced from the end of said bore, said nail having a pointed end, which upon engagement with the slanted guide portion of said guide member, causes the nail to deflect into engagement with the wall of said bore whereupon the nail is deflected back toward the axial direction when constrained between the bore wall and said axially extending guide surface, said nail when completely driven into said nail guide member having its point extending beyond said end surface whereby the fastening unit is securely fastened to the wall or ceiling structure.

4,797,047
EXPANDABLE RETAINER
Peter Gold, 465 North Wood Rd., Rockville Centre, N.Y. 11570
Continuation of Ser. No. 940,335, Dec. 11, 1986, abandoned.
This application Feb. 1, 1988, Ser. No. 150,439
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—512 12 Claims

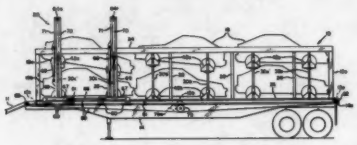
1. A retainer comprising:
a plural-layered assembly defining a generally oblong central opening formed therethrough composed of at least one relatively resilient layer and at least one relatively rigid layer, said rigid layer being split to allow said assembly to radially expand or bend thereby temporarily elongating the minor axis of said generally oblong central opening in said resilient layer to permit insertion of a post therein and to capture said post upon contraction of said minor axis.

4,797,048
BINDING APPARATUS
Michael S. Doery, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 8, 1987, Ser. No. 94,369
Int. Cl.[4] B42C *13/04, 9/00*; H02K *7/06*; G03G *15/00*
U.S. Cl. 412—11 12 Claims



1. An apparatus for binding a set of sheets by applying a tape having adhesive thereon to the spine of the set of sheets, including:
a heated member;
means for detecting the thickness of the set of sheets;
a spring operatively associated with said heated member; and
means, responsive to said detecting means, for compressing said spring a distance dependent upon the detected thickness of the set of sheets so that said spring presses said heated member against the tape with a force dependent upon the detected thickness of the set of sheets to optimize adhesive melt and flow for binding.

4,797,049
SYSTEM FOR LOADING MOTOR VEHICLES INTO STANDARD CARGO-CARRYING ENCLOSURES
Peter Gearin, Portland, and Everett A. Leech, Clackamas, both of Oreg., assignors to G & G Intellectual Properties, Inc., Portland, Oreg.
Filed Dec. 18, 1986, Ser. No. 943,688
Int. Cl.[4] B60P *1/64*; B65D *88/12, 88/52*
U.S. Cl. 414—400 16 Claims



5. A system for containing wheeled vehicles for transport, said system comprising:
(a) an elongate three-dimensional frame;
(b) means for supporting a plurality of wheeled vehicles within said frame in a condition physically isolated from one another at multiple levels whereby certain vehicles are supported in an elevated condition and other vehicles are supported at levels below said certain vehicles;
(c) an elongate three-dimensional closed-sided general-purpose cargo-carrying container separate and apart from said frame for transporting multiple types of cargo, said container having an open end adapted to matingly receive said frame through said end;
(d) means for positioning wheeled vehicles at multiple levels within said frame, while the frame is separate and apart from said container, said means for positioning functioning to position said certain vehicles in said elevated condition; and
(e) power operated means for moving said frame, while loaded with vehicles, through said open end and into matingly received condition within said container.

4,797,050
APPARATUS FOR LIFTING AND TILTING DRUMS OF FLOWABLE MATERIAL
Helmut Habicht, 15 Royal Park Terrace, Hillsdale, N.J. 07642
Filed Jul. 6, 1987, Ser. No. 70,297
Int. Cl.[4] B65G *65/23*
U.S. Cl. 414—420 26 Claims

1. Apparatus for lifting and tilting a drum and like containers of flowable materials brought to a lift device whereat the container is lifted to a desired height above the floor, and during said lift a determined tilt is made to an established angle at which the material in the container is discharged, this apparatus including:
(a) a base support;
(b) a tubular column arrayed in a substantially vertical attitude and secured to said base support;
(c) a slot formed in this column and providing an access opening to the interior of said column, this slot extending for much of the length of this column;
(d) a container support having a bottom portion adapted to receive and retain the weight of the container;
(e) means for retaining the container in a placed condition on the container support during lift and tilting of the container;
(f) movable plate positioned within the tubular column, this

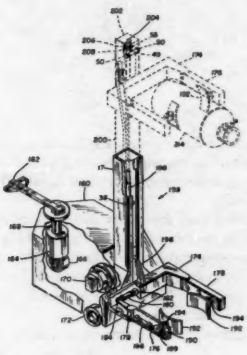
plate having cam follower-type rollers secured to the plate;

(g) U-shaped channel members attached to the column and providing retaining guideways for the cam-follower rollers on the movable plate so that said plate may be cycled up and down the column;

(h) a pinion and meshed spur gear carried on and by said movable plate, the pinion fixedly carried on a rotatable output shaft, with the end portion of said shaft extending through said slot and adapted for securing to the container support, and the spur gear carried on another shaft and rotatable thereon;

(i) a selectively actuated lift-and-lowering means adapted to move the movable plate and the rollers thereon in the U-shaped tracks including a reversible pneumatic motor having an output shaft on which is mounted a roller chain sprocket which is adapted to cycle a roller chain therein, the roller chain arranged so that both ends are attached to the movable plate, and means attaching the lifting-and-lowering means to the movable plate;

(j) an arm secured to said spur gear so as to move said spur gear as the arm is moved, and said arm having a cam follower-type roller thereon;



(k) a cam track secured to the column and adapted to receive and retain said roller on the end of the arm associated with the spur gear, this cam track having an angled portion adapted to engage the cam follower and cause the spur gear to rotate a determined amount, this motion causing rotation of the spur gear and meshed pinion so that a determined rotation of the pinion shaft is made,

(l) means attaching the output shaft to said container support so that during the lift of the movable plate the secured container is lifted and, when the roller on the end of the arm associated with the spur gear is moved in the cam track, said container support and the retained container are tilted to a discharge position, and the lowering motion is adapted to bring the now emptied container and support to the "start" condition and position; and

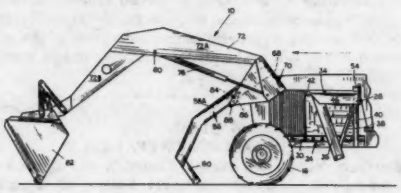
(m) the end of the tubular column being closed by a base plate on which is secured a bracket adapted to rotatably retain a second roller chain sprocket which is disposed to carry and redirect the roller chain attached to the movable plate, and the base plate carrying a secured stop post having adjusting means to limit the downward movement of the movable plate.

4,797,051

LOADER DEVICE FOR A TRACTOR

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Mfg. Co., Inc., Onawa, Iowa

Filed Mar. 26, 1984, Ser. No. 593,699
Int. Cl.[4] E02F *3/34*
U.S. Cl. 414—686 **5 Claims**



1. In combination,

a tractor,

a bracket means secured to the tractor,

said bracket means including a first bracket assembly secured to said tractor at one side thereof,

said bracket means also including a second bracket assembly secured to said tractor at the other side thereof,

each of said first and second bracket assemblies comprising a longitudinally extending, generally flat horizontal support member at the upper end thereof; said support member having rearward and forward ends, and inner and outer sides,

a pivot pin means on the forward end of each of said support members and extending inwardly therefrom,

a first connector element at the rearward end of each of said support members,

a tower assembly adapted to be releasably mounted on said bracket means,

said tower assembly comprising a generally U-shaped frame means including spaced-apart first and second side frames having rearward and forward ends, and a front frame secured to the forward ends of said side frames and extending therebetween; a first upstanding upright secured to said first side frame and having upper and lower ends, inner and outer sides; a second upstanding upright secured to said second side frame and having upper and lower ends, inner and outer sides; the upper ends of said first and second uprights being positioned above said first and second side frames respectively, the lower ends of said first and second uprights being positioned below said first and second side frames respectively, first and second boom arms pivotally connected at their rearward ends to the upper ends of said first and second uprights respectively and extending forwardly therefrom; an implement pivotally secured to the forward ends of said boom arms; first power cylinder means connecting said uprights with said boom arms for raising and lowering said boom arms relative to said U-shaped frame means; second power cylinder means connecting said boom arms and said implement for pivotally moving said implement relative to said boom arms; first and second releasable connection means on said first and second side frames for connection to the inner ends of said pivot pin means on said support members for maintaining said frame means on said bracket means; the rearward ends of said first and second side frames adapted to be releasably connected to said connector elements at the rearward end of said support members for at least limiting the vertical movement of said side frames relative to said bracket means; the rearward ends of said side frames being supported upon said support members,

the lower ends of said uprights being positioned below said support members, during and after the mounting of said tower assembly on said bracket means,

the inner sides of said uprights being positioned outwardly of said support members during and after the mounting of said tower assembly on said bracket means,

the relationship of said uprights to said support members, during the mounting of said tower assembly on said bracket means, serving to prevent the uprights from engaging the sides of the tractor,

the relationship of said uprights to said support members, after the mounting of said tower assembly on said bracket means, serving to prevent lateral movement of the rearward end of said tower assembly relative to said bracket means.

4,797,052

PALLET EXCHANGE APPARATUS

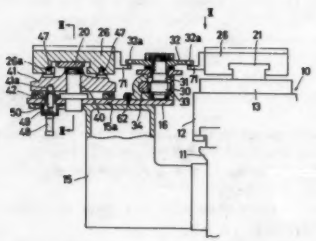
Takeshi Ohta, Nishio; Yoji Kamiya; Kunimichi Nakashima, both of Anjoh, and Mitsuyoshi Taniguchi, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 14, 1986, Ser. No. 885,451

Claims priority, application Japan, Jul. 15, 1985, 60-155789; Aug. 6, 1985, 60-172959

Int. Cl.[4] B65G *47/90*

U.S. Cl. 414—744.3 **4 Claims**



1. A pallet exchange apparatus for exchanging pallets between a table of a machine and a turntable at a loading and unloading station, comprising:

a base, said turntable being rotatably mounted on said base;

pallet engaging means mounted on said turntable;

a movable arcuate pallet guide mounted on said turntable;

engaging blocks mounted on a side surface of said pallets and extending outwardly of a turning radius of said pallets at said loading and unloading station;

a pallet exchange arm rotatably mounted on said base and having engaging portions formed at respective ends thereof; wherein said pallet exchange arm does not extend into said turning radius of said pallets at said loading and unloadng station;

cylinder means mounted on said turntable for shifting said movable arcuate pallet guide between a first position wherein said engaging blocks engage with said engaging portions of said pallet exchange arm and said pallet disengages from said engaging means and a second position wherein one of said pallets engages with said engaging means and said engaging blocks disengage from said engaging portion of said pallet exchange arm;

means for rotationally positioning said turntable at an exchange position;

a pair of fixed arcuate pallet guides secured to said base upon placement of said movable pallet guide therebetween, so as to constitute a circular track for guiding said pallets when said movable pallet guide is shifted to said first position and said turntable is positioned at said exchange position; and

means for rotating said pallet exchange arm while said pallet guide is shifted to said first position and said turntable is positioned at said exchange position, so as to exchange said pallets between said turntable and said table of said machine.

4,797,053

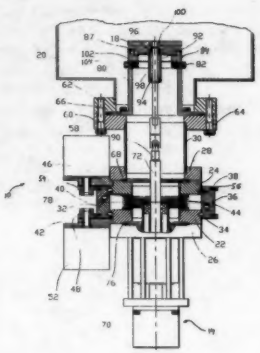
MANIPULATOR FOR VACUUM APPLICATIONS

Valentin Balter, Cupertino, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed Feb. 16, 1988, Ser. No. 156,340

Int. Cl.[4] B65G *54/00*

U.S. Cl. 414—749 **12 Claims**



1. A manipulator for vacuum applications, comprising:

rotary drive means having a rotating output member;

adjustable angular connection means having first and second side members;

first and second ring members and respective drive means for said ring members, said ring members having guide means and being moveable with respect to each other and with respect to said side members along said guide means, said ring members having mating surfaces which are in contact with each other;

said rotary drive means being attached to said first side member;

said mating surfaces of said ring members being located in a plane which is nonperpendicular to an axis of rotation of said output member, so that roation of said first ring member with respect to said second ring member will cause the side member corresponding to said first ring member to be moved to an angular position relative to said second side member;

rotating driven means connected to said output member through a universal joint which allows angular articulation and axial displacement between said output member and said rotating driven means;

spacing means which embraces said rotating output, said universal joint means, and a part of said rotating driven means, said spacing means having first attachment means for connection to said second side member, and second attachment means for connection to a vacuum chamber;

a rigid frame means connected to the surface of said second attachment means on the side thereof facing said vacuum chamber, so that said frame means extends into the interior of said vacuum chamber;

first sliding means and means for guiding said first sliding means on said frame means for linear movement in one linear direction;

second sliding means and means for guiding said second sliding means on said first sliding means in a second linear direction perpendicular to said one linear direction;

said second sliding means supporting said driven means in a rotating manner;

said driven means passing through said both sliding means so

that its end which is opposite to said universal joint means protrudes through said first and second sliding means;

sample holding means which are attached to said protruding end of said driven means so that said sample holding means forms a gap with said second sliding means; and

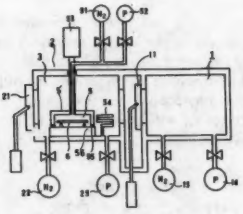
sealing means which seals an interior of said manipulator which communicates with said vacuum chamber, said sealing means surrounding said output member and said driven means.

4,797,054

APPARATUS FOR LOADING AND UNLOADING A VACUUM PROCESSING CHAMBER

Katsuyuki Arii, Tama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 13, 1986, Ser. No. 874,000
Claims priority, application Japan, Jun. 17, 1985, 60-131013
Int. Cl.[4] B65G *11/00*
U.S. Cl. 414—217 12 Claims



1. An apparatus for loading and unloading a workpiece into and from a vacuum chamber for processing the workpiece, said apparatus comprising:

a loadlock chamber coupled to the vacuum chamber, the workpiece being loaded into or unloaded from the vacuum chamber through said loadlock chamber and the workpiece being loaded from or unloaded into an external atmosphere through said loadlock chamber;

evacuation means, operatively connected to said loadlock chamber, for evacuating said loadlock chamber;

gas introduction means, operatively connected to said loadlock chamber, for introducing gas into said loadlock chamber;

first gate means, provided between the external atmosphere and said loadlock chamber, for allowing loading said workpiece into and unloading said workpiece from said loadlock chamber, said first gate means being capable of opening or providing a vacuum seal between said loadlock chamber and the outside;

second gate means, provided between the vacuum chamber and said loadlock chamber, for allowing transfer of the workpiece to and from said loadlock chamber into the vacuum chamber, said second gate means being vacuum sealed when said first gate means is open or when inner pressure of said loadlock chamber is higher than a predetermined level;

a table provided in said loadlock chamber on which the workpiece is placed;

a second chamber, provided in said loadlock chamber, being capable of contacting said table for enclosing the workpiece and isolating the workpiece from said loadlock chamber while said loadlock chamber is being evacuated or gas is being introduced therein, said second chamber having a bottom opening having a periphery;

pressure control means, connected to said second chamber, for keeping the gas pressure in said second chamber greater than or equal to the gas pressure in said loadlock chamber by providing a slow leak means around the periphery of the bottom opening said second chamber; and

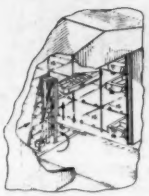
transfer means, located outside of said second chamber and within said loadlock chamber, for transferring the workpiece, positioning the workpiece on said table, and moving the workpiece from said table while said second chamber is separated from said table so as to expose said workpiece in said loadlock chamber.

4,797,055

LOAD MOVING APPARATUS

Peter C. Tworoger, Astor, and E. A. Johnson, Crescent City, both of Fla., assignors to Atlas Marine Technologies, Gibsonburg, Ohio

Filed Dec. 18, 1986, Ser. No. 943,568
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—283 5 Claims



1. A boat handling system for lifting, transporting and storing boats in a cellular storage facility, the storage facility having an access aisle parallel to a plurality of rows and columns of boat receiving stalls, the system comprising:

a first set of rails extending the length of the aisle and continuing to a boat loading location;

a base structure having rollers positioned to ride on the first set of rails for effecting movement of the base structure along the rails;

a second set of rails attached to the base structure for movement therewith, the second set of rails being oriented orthogonally to the first set of rails;

a support assembly having rollers positioned to ride on the second set of rails for effecting movement of the support assembly thereon, the support assembly including a lower base plate to which the support assembly rollers are coupled and an upper base plate rotatably coupled to the lower base plate for rotation about a vertical axis therethrough;

a tower assembly mounted on the upper base plate, the tower assembly including a vertically extending tower, a guide slidably coupled to the tower for vertical motion therealong, and a fork slidably coupled to the guide for vertical motion therealong, the fork being adapted for supporting a boat; and

means coupled to the tower assembly for effecting movement of the guide and the fork for raising and lowering the fork to selected positions and for moving the tower assembly along the first and second sets of rails for transporting boats between selected ones of the stalls and the loading location comprising:

(i) a hydraulic cylinder having a pistion vertically extendible along the tower assembly;

(ii) a first pulley attached to an end of the piston for movement therewith;

(iii) a first cable having one end attached to the support assembly and a second end attached to the guide, the cable passing over the pulley whereby movement of the piston affects motion of the guide;

(iv) a second pulley attached to the guide for movement therewith; and

(v) a second cable having one end attached to the fork and a second end attached to a variable position stop, the second cable passing over the second pulley whereby

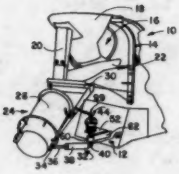
motion of the guide effects extension of the second cable until the second end thereof reaches the stop and thereafter effects motion of the fork along the guide.

4,797,056

SAFETY BRAKE FOR CEMENT TRUCK CHUTE

Charles Gerold, 2839 Ilopango, Hacienda Heights, Calif. 91740, and John Gregorio, 1533 E. Dexter, Covina, Calif. 91724

Filed Jul. 20, 1987, Ser. No. 75,131
Int. Cl.[4] B65G *67/24*
U.S. Cl. 414—467 **11 Claims**



1. A cement truck discharge chute locking system for preventing lateral rotation of a chute ram relative to the truck chassis comprising:

a vertically orientated ram pivot axle secured to said chute ram and rotatably mounted relative to said truck chassis,

a first flat, annular brake element secured in horizontal disposition relative to said truck chassis and radially outwardly from said ram pivot axle and coaxial relative thereto,

a second flat, annular brake element coupled to said ram pivot axle in coaxial alignment therewith and located radially outwardly therefrom and juxtaposed vertically adjacent to said first brake element and including,

pneumatic actuation means having ga reciprocal plunger extending from a housing in coaxial alignment with said ram pivot axle,

first means rigidly coupling said housing to said ram pivot axle,

second means rigidly coupling said plunger to said second brake element, whereby said pneumatic actuation means is actuable to press said second brake element against said first brake element over an annular surface area of contact coaxial with and located radially outwardly from said ram pivot axle to thereby immobilize said ram from rotation relative to said truck chassis and alternatively deactuable to vertically separate said brake elements, thereby permitting rotation of said ram relative to said truck chassis.

4,797,057

WHEEL-LIFT TOW TRUCK

Gary L. Shoup, Greencastle; Allen B. Coffman, Mercersberg, both of Pa., and Robert L. Fix, Hagerstown, Md., assignors to Jerr-Dan Corportion, Greencastle, Pa.

Filed Aug. 20, 1985, Ser. No. 767,740
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—563 **33 Claims**

1. A tow truck for lifting a part of a vehicle and towing the vehicle comprising:

(a) a tow truck chassis including spaced frame members and a deck above said frame members, and said tow truck chassis having a forward end and a rearward end including a rear wheel axle,

(b) means for engaging a vehicle for lifting a part thereof,

(c) an extensible boom having an inner end and an outer end and means supporting said engaging means at said outer end,

(d) means for raising and lowering said boom comprising:

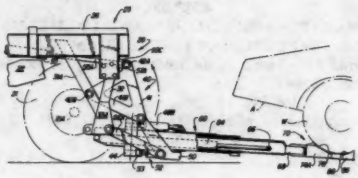
(i) linkage means for causing movement of said boom while maintaining said boom at a substantially constant angle to the horizontal, and

(ii) motor means for causing said raising and lowering movement of said boom,

(e) means for horizontally swinging said boom comprising:

(i) means for pivotally supporting said boom for rotation about a substantially vertical axis, and

(ii) motor means for effecting horizontal swinging movement of said boom,



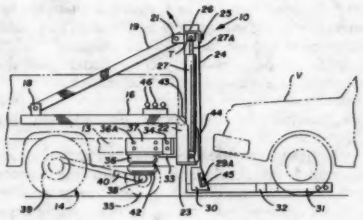
(f) said boom raising and lowering means and said boom swinging means being below said deck and said boom raising and lowering means moving said boom between a first position in which the inner end of said boom is rearwardly of said tow truck rear axle, and a second position in which the inner end of said boom is forward of the axis of said tow truck rear axle.

4,797,058

AUTOMOBILE WHEEL LIFT

Michael Bilas, 2730 Columbiana-New Castle Rd., New Springfield, Ohio 44443

Filed Jun. 8, 1987, Ser. No. 59,029
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—563 **3 Claims**



1. An automobile wheel lift device used to convert a pick-up truck have a rear axle assembly into a tow truck, comprises a horizontally extending support frame secured to a truck frame on said pick-up truck, said support frame is comprised of elongated side and end rails in a generally rectangular arrangement having extension support frame members extending in a vertical direction at right angles thereto, boom members pivotally secured to a portion of said support frame, a lift tube movably positioned on said extension support frame member of said support frame rearwardly of said rear axle assembly, said lift tube pivotally secured on one of its ends to said boom members, an automobile engagement element pivotally secured to the other end of said lift tube, means on said automobile engagement element for securing an automobile thereon, means for securing said support frame to said truck frame rearwardly of said rear axle and wheel assembly, hydraulic piston and cylinder assemblies pivotally secured to a portion of said support frame between said extension of said support frame members extending at right angles therefrom rearwardly of said rear axle and wheel assembly, and to said lift tube at said one

of its ends, for lifting said lift tube from a first vertically aligned position at rest to a second position angularly disposed from said vertical, and said auto engagement element in relation to said support frame, a supplemental wheel and axle assembly mounted between said axle and said extension support frame members and pivotally secured to said truck, and lift tube guide means on said support frame.

4,797,059

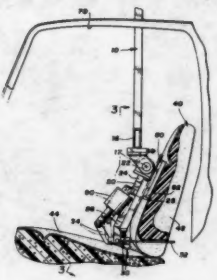
SEAT HANDLING FIXTURE

Rodrick D. Karg, Oxford, and Thomas N. Whetstone, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 928,812, Nov. 7, 1986, abandoned. This application May 6, 1988, Ser. No. 193,157

Int. Cl.[4] B66F 9/00

U.S. Cl. 414—590 8 Claims



1. A fixture for use with an overhead lifting device for transporting a seat having a seat back and a seat cushion into a vehicle, said fixture in combination comprising:

a "C" frame with spaced apart upper and lower legs, said upper leg providing means of connection with said lifting device;

a first link pivotally connected at one end with said lower leg of said "C" frame and projecting in a generally downward direction along a pivotal axis generally parallel with said lower leg;

a second link pivotally connected to the other end of said first link remote from said "C" frame at an angle with said first link for penetrating between said seat back and said seat cushion; and

lift means to angularly raise said second link whereby said seat is captured with said fixture so that said seat can be transported by said lifting device.

4,797,060

EARTH-WORKING MACHINE

Mitsuhiro Kishi, 1320 Mizuhonocho, Ashikaga-shi, Tochiga-prefecture 326-03, and Yokichi Nagasawa, 1902, Honjo 2-chome, Ashikaga-shi, Tochigi-prefecture 326, both of Japan

Continuation of Ser. No. 823,922, Jan. 30, 1986, abandoned, which is a division of Ser. No. 503,688, Jun. 13, 1983, Pat. No. 4,596,508. This application Oct. 8, 1987, Ser. No. 107,868

Claims priority, application Japan, Jul. 22, 1982, 57-128468; Sep. 18, 1982, 57-162971; Nov. 1, 1982, 57-192120; Jan. 28, 1983, 58-13376

Int. Cl.[4] E02F 5/02

U.S. Cl. 414—687 8 Claims

1. An earth-working machine comprising:

a mobile chassis;

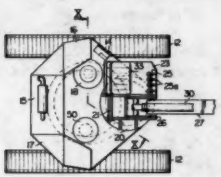
a turntable mounted centrally on said mobile chassis and rotatable on said mobile chassis about an axis of said turntable;

a carriage mounted on approximately one half side of said turntable and rotatable on said turntable about an axis of said carriage, said axis of said carriage being in horizontal eccentric relation to said axis of said turntable;

an earth-working mechanism mounted on said carriage;

first driving means mounted on a top of said turntable for rotating said turntable horizontally and with respect to said chassis;

second driving means mounted on a top of said turntable for rotating said carriage horizontally and with respect to said turntable independently of rotation effected by said first driving means;



said first and second driving means being mounted on the other half side of the turntable laterally adjacent said carriage, the axis of said carriage and said first and second driving means forming an isosceles triangle with the axis of said carriage being located on a line perpendicularly bisecting a line joining the axes of said first and second driving means,

sprockets and an endless chain connected to said sprockets operatively connected to said carriage and said second driving means for turning said carriage via said second driving means.

4,797,061

MULTI-JOINTED ROBOT

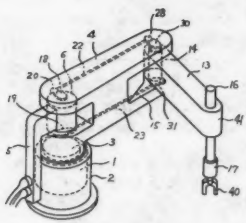
Tadashi Munakata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 10, 1987, Ser. No. 13,136

Claims priority, application Japan, Mar. 3, 1986, 61-44131

Int. Cl.[4] B25J 17/00

U.S. Cl. 414—744.5 9 Claims



1. A multi-jointed robot, comprising:

a first arm;

first drive means connected to the first arm and having a central axis, for pivotally moving the first arm about the central axis;

a second arm, pivotally connected to the first arm for relative motion, therebetween; and

second drive means for moving the second arm with respect to the first arm, including a low-speed, high-torque motor and motor drive shaft means directly extending from opposite sides of the motor and being operatively connected to the second arm on the both sides of the motor for reducing stress on the motor, wherein the shaft means includes a rotatable shaft protruding from opposite sides

of the motor, a pair of connecting rods, each connecting rod being directly connected to the shaft on an opposite side of the motor for transmitting the motion of the shaft to the second arm, and coupling means for jointing the shaft to the connecting rods.

4,797,062

DEVICE FOR MOVING GAS AT SUBATMOSPHERIC PRESSURE

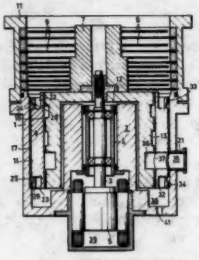
Ludger Deters, Cologne; Heinrich Engländer, Linnich; Hans-Peter Kabelitz, and Günter Schütz, both of Cologne, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 713,993, Mar. 20, 1985, abandoned. This application Oct. 20, 1987, Ser. No. 111,150

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410905

Int. Cl.[4] F01D *1/36*

U.S. Cl. 415—90 17 Claims



1. A device for accommodation in a housing and moving a gas at subatmospheric pressure, the device comprising:

a rotor and a stator wherein the stator axially surrounds the rotor with a space for relative rotation formed therebetween;

first and second screwthread-like structures in tandem axially along at least one of the rotor and stator respectively for moving the gas upon relative rotation between the rotor and stator and for forming a viscous seal therebetween; and

thermal insulation means for thermally insulating the stator from the housing.

4,797,063

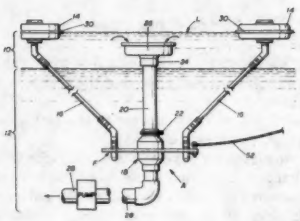
FLOATING SUCTION APPARATUS

Gerald Lott, Houston, Tex., assignor to Chem-O Company, Inc., Houston, Tex.

Filed May 27, 1987, Ser. No. 54,742

Int. Cl.[4] F04D *31/00*

U.S. Cl. 415—116 18 Claims



1. An apparatus for floating within immisible layers of fluid above a bottom surface in order to withdraw fluid from a preselected layer comprising:

a frame;

floatation means connected to said frame for securing said frame at a preselected elevation within the fluid;

pump means mounted with said frame for drawing fluid in the apparatus said pump means including pump intake means; and

positioning means for mounting said pump intake means at various vertical positions above and below said frame, said apparatus being independent of contact with the bottom surface.

4,797,064

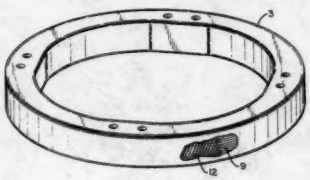
COMPOSITE HELICOPTER ROTOR HUB

Donald L. Ferris, Newtown, Conn., and Francis E. Byrnes, White Plains, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1987, Ser. No. 80,370

Int. Cl.[4] B64C *11/06*

U.S. Cl. 416—134 A 14 Claims



1. A main helicopter rotor hub having a retention plate, said retention plate comprising:

(a) a fiber reinforced braided tubular ring said fiber reinforced resin braided tubular ring having substantially circumferential fibers interwoven with angled fibers oriented at a predetermined angle to said: circumferential fibers said circumferential and angled fibers disposed about a central core; and

(b) arm means for attaching said braided ring to a driveshaft said arm means extending inwardly from said braided ring; wherein said fiber orientation withstands forces both in the plane of said retention plate and normal to said plane.

4,797,065

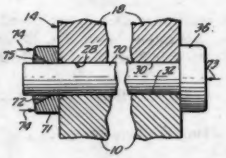
TURBINE BLADE RETAINER

Frank J. Conlow, Allentown, N.J., assignor to Transamerica DeLaval Inc., Princeton, N.J.

Division of Ser. No. 920,168, Oct. 17, 1986, which is a continuation-in-part of Ser. No. 758,487, Jul. 24, 1985, abandoned. This application Apr. 18, 1988, Ser. No. 182,443

Int. Cl.[4] F01D *5/32*

U.S. Cl. 416—220 R 2 Claims



1. In a turbine rotor, the combination comprising a wheel having an angularly spaced plurality of radially outwardly

directed fir-tree formations about the wheel axis and defining axially extending slots between adjacent profiles of adjacent fir-tree formations, a corresponding plurality of blades each of which has a root configured for radial retention in one of said slots by reason of root profiling in axially engageable conformance with adjacent profiles of the adjacent fir-tree formations of said one slot, the axial extent of said blade root being equal to the axial width of said fir-tree formations, radially inner confronting limits of said blade root and of the root-engaged slot between fir-tree formations being spaced to define a through-passage on an alignment parallel to the wheel axis, and an elongate two-part axially extending retainer having a cylindrical outer surface of said alignment and nested between said confronting limits; one of said retainer parts having (a) a headed end, (b) a contiguous cylindrical shank defining the entire cylindrical outer surface and of length of its outer end exceeding the axial extent of said root and wheel formations; the other of said retainer parts being a collar having a bore engaged to said outer end and having an axially outwardly open counterbore which is lapped by said outer end; said headed end and said collar (a) being of sufficient radially outward extent to lap both said root and wheel formations when in engaged relation and (b) being in axially compressed engagement to said root and wheel formations and (c) being welded to each other at lap of said counterbore with said outer end for retention of said axially compressed engagement.

4,797,066

TURBINE WHEEL HAVING HUB-MOUNTED ELASTICALLY DEFORMABLE BLADE MADE OF REINFORCED POLYMERIC COMPOSITE MATERIAL

Karl-Otto Strömberg, Kilgränd, S-302 40, Halmstad, Sweden

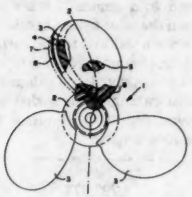
PCT No. PCT/SE87/00036, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987, PCT Pub. No. WO87/04400, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 28, 1987, Ser. No. 102,563

Claims priority, application Sweden, Jan. 28, 1986, 8600369

Int. Cl.[4] B63H *1/26*

U.S. Cl. 416—230 **4 Claims**



1. A turbine wheel, comprising:

a hub, said hub having secured thereto for rotation with the hub about an axis of the hub, a plurality of circumferentially-spaced blades each having a pitch relative to said hub;

each said blade being made of a built-up composite material having a matrix of polymeric material and a plurality of superimposed layers of reinforcing material having anisotropic properties, including at least one internal reinforcement and an enclosing shell-shaped external reinforcment;

said blades being elastically deformable, in use, relative to said hub, under loading, including strains, including deformation about a turning center of each blade for reversibly altering the pitches of said blades;

said internal reinforcement of each blade including a rigid beam arranged in the turning center of the respective blade;

each said beam being made of fibrous reinforcing material having a fiber direction arranged at a non-coinciding angle to the turning center of the respective blade;

each said external reinforcement being connected to said beam of the respective blade for cooperation therewith in portions wherein said blade is thereby made less rigid.

4,797,067

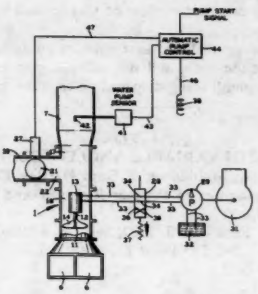
PUMPING SYSTEM WITH DESILTING ARRANGEMENT

J. David Eller, Deerfield Beach, and Juan E. Ponce, Boca Raton, both of Fla., assignors to M & W Pump Corporation, Deerfield Beach, Fla.

Filed Oct. 13, 1987, Ser. No. 107,273

Int. Cl.[4] E02F *3/88*; F04B *49/00, 49/10*

U.S. Cl. 417—43 **16 Claims**



1. Pumping system with desilting arrangement comprising: a bidirectional water pump, being operable in the forward and the reverse direction; a pump housing for containing the pump, having a pump inlet at one end and a pump outlet at the other end; a silt blow-out pipe in fluid communication with the pump outlet, having a desilting valve therein; a water discharge pipe containing a flow sensor, both being in fluid communication with the pump outlet; a pump drive means connected to the pump; and means to direct both operation of the pump in a reverse direction and the desilting valve responsive to an absence of a water flow signal from the flow sensor, for the purpose of blowing out any silt in the pump inlet.

4,797,068

VACUUM EVACUATION SYSTEM

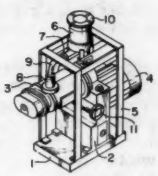
Tadashi Hayakawa; Kazuaki Shiinoki, both of Ebina; Sinji Mitsuhashi, Yokohama, and Kotaro Naya, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,821

Claims priority, application Japan, Jun. 12, 1986, 61-134837

Int. Cl.[4] F04B *37/14, 23/08*

U.S. Cl. 417—201 **9 Claims**



1. A vacuum evacuation system comprising:

a first vacuum pump having a rotary component which is adapted to rotate at high speeds to produce a linear velocity and against which gas molecules are caused to strike, thus giving momentum of said rotary component in a direction of the linear velocity of the rotary component to produce a gas flow in a given direction;

a second vacuum pump having a casing provided with suction and exhaust ports between which a gas flow passage is defined and in which a pair of male and female screw rotors are supported with a minute gap between said screw rotors and said casing, the inner surface of said casing and said pair of male and femal screw rotors defining a working chamber in which said screw rotors rotate with a minute gap maintained therebetween in the absence of sealing, cooling and lubrication liquid, within said working chamber and the gas flow passage thereby producing a differential pressure between the suction and exhaust ports provided in said casing;

means connecting said exhaust port of said first vacuum pump to said suction port of said second vacuum pump; and

said suction port of said first vacuum pump being disposed on a vacuum side, and said exhaust port of said second vacuum pump being disposed on an atmospheric side.

4,797,069

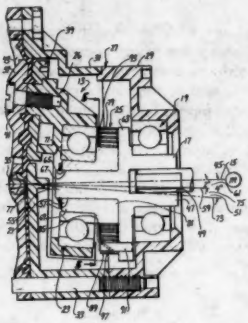
PUMP WITH VARIABLE ANGLE WOBBLE PLATE

E. Dale Hartley, Malibu, and F. Scott Hartley, Camarillo, both of Calif., assignors to Product Research And Development, Anaheim, Calif.

Filed Jun. 3, 1987, Ser. No. 57,808

Int. Cl.[4] F04B *1/28*; F01B *3/00*

U.S. Cl. 417—222 **14 Claims**



1. An apparatus for moving a fluid medium and adapted to be driven by a motor, said apparatus comprising:

a positive displacement member movable on intake and discharge strokes to move the fluid medium;

a wobble plate coupled to the positive displacement member with the wobble plate having an angle which influences the length of said strokes and the volume of the fluid medium moved by the positive displacement member;

rotatable driving member rotatable about a rotational axis and adapted to be driven by the motor about a rotational axis;

a rotatable driven member mounted on the driving member for rotation relative to the driving member about a driven member axis which is eccentric to said rotational axis to thereby vary the relative angular position of the driving and driven members, said driven member being drivingly coupled to said wobble plate;

means including said rotational axis and said driven member axis for adjusting the angle of the wobble plate as a function of the relative angular position of the driving and driven members; and

a resilient torque transmitting coupling for coupling the driving member to the driven member so that rotation of the driving member drives the driven member and the relative angular position of the driving and driven members about said rotational axis and said driven member axis and the wobble plate angle are related to the torque transmitted by the torque transmitting coupling.

4,797,070

DISPLACEMENT COMPRESSOR FOR SUPERCHARGING OF COMBUSTION ENGINES

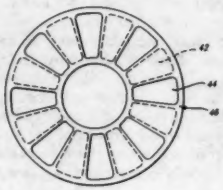
Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Continuation of Ser. No. 609,956, May 14, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 892,872

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318136

Int. Cl.[4] F04B *35/00, 39/00*

U.S. Cl. 417—380 **6 Claims**



1. Displacement compressor for compression of gases, preferably for supercharging internal combustion piston engines having an air charge chamber equipped with one air input and one air output, with a flexible membrane for changing the volume firmly fastened to a wall, distinguished by the fact that the membrane (16, 62, 78) is composed of tightly fitting single elements (40, 76) which are movable relative to each other and are made from a heat-resistant material;

said single element (76) being closely fitting strips or threads;

said membrane being plate-shaped and movable in an axial direction;

said membrane comprised of laminations (84) which are flexibly fastened to a center bracket (88) and an outer bracket (86) such that said center bracket (88) is positioned rotationally on a normal axis to the surface of the lamination, relative to the outer bracket (86);

said membrane being driven by exhaust gases from said internal combustion engine such that movement of said membrane is synchronized with piston movement of said internal combustion engine.

4,797,071

MOTOR AND VANE-PUMP ASSEMBLY FREE FROM EXTERNAL OIL LEAKS

Gilles Veyrat, Minzier, France, assignor to Alcatel, Paris, France

Continuation of Ser. No. 900,434, Aug. 26, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 166,781

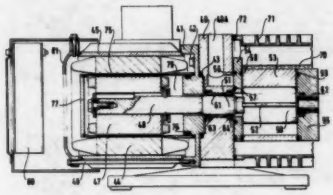
Claims priority, application France, Aug. 27, 1985, 85 12774

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—410 **7 Claims**

1. A motor and vane-pump set comprising a vane-pump for pumping a gas and comprising a stator (53) and a rotor (50) fitted with vanes (52) and extended by a shaft (51), a gas suction duct (40A) leading to the interior of the stator (53), said rotor and stator assembly being immersed in a tank (71) partially filled with oil, said shaft rotating in bearings (61, 62) lubricated by said oil immersing said rotor and stator assembly and fitted with lip seals (63, 64) said pump shaft being rotated by an electric motor open to the atmosphere comprising a stator (44) and a rotor (47) fitted with a shaft (48), the motor and vane-pump set being characterized in that the rotor shafts (48, 51) of the motor and the pump are joined together and in that a sleeve (75) of non-magnetic material is coaxially dis-

posed between the stator (44) and the rotor (47) of the motor, said sleeve being closed at its far end from the pump by a cover (77), and fixedly mounted in a sealed manner at its opposite end on a motor end plate (41) which is fixed to the pump, whereby



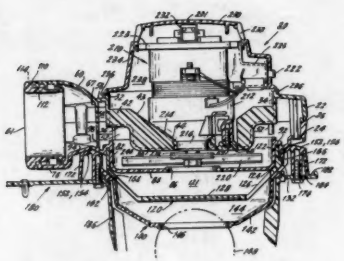
said sleeve (75), said cover (77) and said motor end plate (41) form a sealed volume (79) which collects oil leaking through the lip seal (63) to prevent it from contaminating the exterior of the motor and vane-pump set without disturbing the motor operation.

4,797,072

PORTABLE ELECTRIC BLOWER

Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Craig A. Seasholtz, Avis, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jun. 19, 1987, Ser. No. 64,768
Int. Cl.[4] F04B *35/04*; A47L *5/22*
U.S. Cl. 417—423.2 **9 Claims**



1. An air blower, comprising:

an external housing, an air inlet into the housing, an air outlet from the housing, a motor in the housing, a centrifugal fan in the housing having a periphery and connected to be driven by the motor for drawing air into the housing inlet and for blowing air out the housing outlet;

a support located in the housing for supporting the motor and the support being shaped and so disposed in the housing for providing air separation between the motor and the fan;

the housing including a chamber outside the periphery of the centrifugal fan and at the fan side of the support for the motor, and the chamber communicating with the outlet from the blower;

the inlet to the housing including an inlet opening through which air is drawn into the housing and the fan being disposed near the inlet opening;

an intake shield sealingly attached to the housing and extending past the inlet to the housing; where the intake shield extends past the inlet opening, the intake shield being spaced from the housing and from the housing inlet; and

air passage means through the intake shield for enabling air to be drawn past the intake shield and into the housing inlet;

said intake shield serving as an external surface of the housing shaped and disposed so that the entire blower may be sealed upon the intake shield external surface; the air passage means on the intake shield being generally off the intake shield external surface so as not to be blocked if the intake shield surface is against another or supporting surface;

said external housing further including a blower housing having therein the air inlet and air outlet of the external housing;

said blower housing comprising separate upper and lower portions which are held together, the lower portion being attached to the intake shield, and the support for the motor being part of the upper portion of the blower housing;

each of said upper and lower portions of the blower housing having a first cooperating section, which cooperating sections constitute sidewall sections that are combined to define said air outlet; and

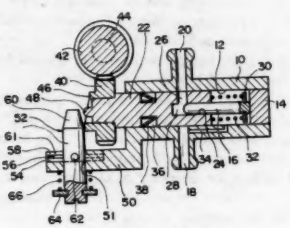
each of said upper and lower portions of the blower housing having a second cooperating section, which second cooperating sections define a chamber wherein said fan is disposed.

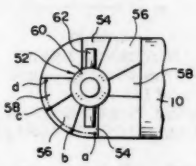
4,797,073

PUMP WITH ROTATING AND RECIPROCATING PISTON

Kenichi Kubota, Iwate Prefecture, Japan, assignor to Tohoku Mikuni Kogyo Kabushiki Kaisha, Japan

Filed Oct. 9, 1987, Ser. No. 106,370
Claims priority, application Japan, Oct. 20, 1986, 61-159478[U]; Oct. 31, 1986, 61-167466[U]
Int. Cl.[4] F04B *19/02*, *7/06*
U.S. Cl. 417—461 **15 Claims**





1. A plunger pump including:

a worm adapted to be rotated as a crankshaft is rotated,

a cylindrical pump body having a bore having a closed end, a suction port and a delivery port formed therein, said suction port and said delivery port communicating with said bore,

a plunger having one end rotatably and slidably fitted into the bore of the pump body in a cantilevered fashion with a free end external to said pump body, a pump chamber

formed in said plunger, said pump chamber being brought into fluid communication alternately with the suction port and the delivery port,

a cam surface on the end face of the free end of the plunger, said cam surface being inclined relative to the axis of the plunger,

an adjustment cam in the form of a projection extending axially from said plunger, through the center of said cam surface, at the free end of the plunger to carry out a camming function in cooperation with said cam surface,

first engagement means, provided on the outer periphery of the plunger adjacent said free end, for engaging said worm,

biasing means for biasing the plunger toward said free end,

a control pin mounted on the pump body for contact with said cam surface or the adjustment cam, and

wherein said worm is directly connected to the crankshaft and is directly engaged by said first engagement means, with the worm not being held directly by the pump body.

9. A plunger pump of the type rotably driven by a crankshaft, said plunger pump comprising:

a cylindrical pump body having a central, longitudinal bore, a suction port and a delivery port, said bore opening through said pump body at one end and closed at the other end;

a plunger rotatably and slidably mounted within said bore and a pumping chamber within said plunger;

rotary drive means for rotating said plunger responsive to rotation of the crankshaft;

means for alternately establishing fluid communication between said pumping chamber and said suction port and between said pumping chamber and said delivery port, as said plunger is rotated;

an end face cam provided on a first end of said plunger, said first end extending beyond said open end of said bore, said end face cam being inclined relative to the axis of the plunger;

a projection extending axially from the center of said first end of said plunger defining a camming surface in cooperation with said end face cam;

biasing means for urging said plunger outward, through the open end of said bore;

a control pin mounted on said pump perpendicular to the axis of said plunger and having a free end continuously engaging said camming surface, thereby limiting the outward movement of said plunger, said free end being tapered so that the diameter of said free end at the point of contact with said camming surface is changed by adjustment of the position of said free end of said control pin relative to the axis of said plunger;

and means for adjusting said position of said free end of said control pin.

4,797,074

GOVERNOR DEVICE

Gregory P. Albert, Waverly, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 29, 1987, Ser. No. 67,994

Int. Cl.[4] F01C *21/12*; G05D *13/10*

U.S. Cl. 418—41 **9 Claims**

1. A motor speed controller for pressure fluid operated motors comprising:

a pressure fluid motor;

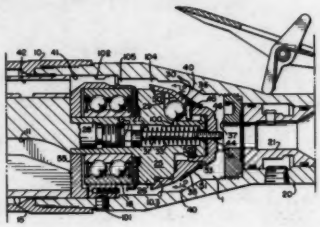
a controller body rotating in proportion to the speed of said motor;

a plurality of balls disposed on said controller body for radial displacement upon increase of rotation speed;

a control means surrounding said controller body and mounted thereon for resilient resisted axial extension in response to the radial displacement of said balls; and

a face seal means on said control means for cooperation with a face seat means for controlling air flow to said pressure fluid motor in response to motor speed;

said control means further comprises:



a hollow cone which overlays said controller body, and;

said control means forms a sealed cover over said controller body at low speed.

4,797,075

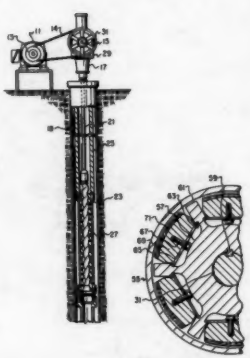
OVERSPEED PROTECTIVE GEAR BOX FOR A WELL PUMP

Wallace L. Edwards, Stockton, Mo.; Joel F. Jones, Claremore, and Howard G. Thompson, Jr., Tulsa, both of Okla., assignors to Hughes Tool Company, Houston, Tex.

Filed Apr. 9, 1987, Ser. No. 36,218

Int. Cl.[4] F04C *5/00, 15/00, 2/107*; F04B *49/02*

U.S. Cl. 418—48 **2 Claims**



1. A progressing cavity well pump assembly, comprising in combination:

a power source;

a right angle gear box adapted to be mounted over the well, having a horizontally oriented input shaft adapted to be rotated by the power source and a vertically oriented output shaft adapted to be connected to a string of rods extending into the well, the gear box having gear means for rotating the output shaft at a lesser speed than the input shaft;

a stator having a helical elastomeric interior and adapted to be located stationarily in the well;

a helical rotor adapted to be connected to the lower end of the string of rods and rotatably carried in the stator for pumping fluid to the surface;

a carrier mounted to the input shaft for rotation therewith;

a cylindrical brake drum stationarily positioned around the carrier;

a plurality of brake shoes carried by the carrier and facing

radially outward from the input shaft toward the brake drum; and

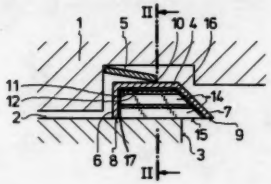
spring means mounted between the carrier and the brake shoes for maintaining the brake shoes spaced from the drum during normal rotation of the input shaft, and for allowing the brake shoes to contact the drum should the speed of the input shaft exceed a selected level, to slow reverse rotation of the input shaft due to torque in the rods as a result of the rotor locking in the stator.

4,797,076

INNER SEAL OF A ROTARY PISTON ENGINE

Dankwart Eiermann, Weissenberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,592
Int. Cl.[4] F01C *19/00*; F04C *27/00*; F16J *15/34*
U.S. Cl. 418—142 **5 Claims**



1. An inner face seal, which is arranged axially in an end surface of a rotary piston engine of trochoidal-type construction including an eccentric shaft and a housing with axially opposite housing sidewalls and with an inner periphery having at least one arcuate runway as well as said housing sidewalls having central axial bore openings through which said eccentric shaft passes and journals a multi-corner rotary piston rotating upon said eccentric shaft, said seal having a base body U-shaped in axial cross section including a base surface and legs having a scraper edge at an outward end thereof extending therefrom, which legs form two sealing rings including end surfaces effective as inner sealing surfaces that glide and move along an adjoining housing sidewall under resilient spring-effect pressing engagement of said sealing surfaces, as well as means defining a bore opening in this housing sidewall and located coaxial to the eccentric shaft, said opening being partially polished and wipedover by the inner sealing surfaces during rotation of the piston, the improvement therewith which comprises:

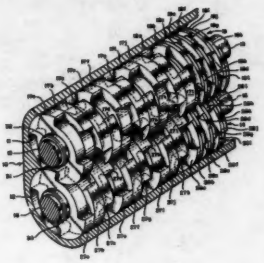
that a plurality of resilient trapezoidally shaped sealing lamination segments in layers tightly placed for overlapping each other in a closely matched relationship with freedom of resilient movability thereof being maintained although secured at the base surface in the U-shaped base body, so that said sealing lamination segments allow said legs to move and engage resiliently for sealing purposes along said housing sidewall so as to be pressed and engaged via the scraper edges thereof leading in a rotational direction and having an acute abutting angle at sealing engagement location of said sealing surfaces, said scraper edges forming an angle α in rotational direction via a radius of the inner face seal to assure that oil residues are cleared away and discharged under effectiveness of centrifugal force along with close sequence of said scraper edges whereby large oil quantities or volume can never collect.

4,797,077

ROTARY EXPANSIBLE CHAMBER DEVICE

Dean R. G. Anderson, 1306 W. Bluff Rd., Syracuse, Utah 84121

Filed Sep. 27, 1984, Ser. No. 655,357
Int. Cl.[4] F01C *1/14*
U.S. Cl. 418—201 **17 Claims**



1. A rotary expansible chamber device being adapted for compression or expansion of a compressible gas said device comprising:

(a) a housing defining two or more parallel cylindrical working chambers,

(b) mating, stepped impellers adapted to axially pass a compressible gas along the length thereof through said working chambers, said impellers being rotatably mounted about an axis in each of said working chambers for rotation in opposite directions to each other, each of said stepped impellers consisting of a plurality of offset risers having an outer and inner radius, each riser of all said stepped impellers having the same peripheral constant cross section and consisting of at least one lobe having at least one well adjacent thereto, said lobes having an arcuate outer surface which defines the outer radius, said wells having an arcuate lower surface which defines the inner radius, said wells also having concave sidewalls, said lobes and wells of adjacent risers along the same impeller being offset angularly from each other in a stepped spiraling relationship opposite the direction of impeller rotation in the direction of axial compressible gas flow along the axis of said impeller with the offset lobes forming spiraling angular steps and the offset wells defining a stepped helical volume, the risers along the axis of said impellers being a predetermined height which height will vary to enable the compression or expansion of a compressible gas within said working chambers, said impellers being mated such that, as said impellers rotate, a compressible gas passing axially through said working chambers will be sealed as a 360° helical stepped gas volume in said helical volume by the rotation of said impellers and remain sealed with a change of sealed helical stepped gas volume size as a result of the angular rotation and variation in riser height as said compressible gas axially traverses through said working chambers, and

(c) inlet means in said housing forward of said impellers for introducing a compressible gas into said working chambers and outlet means in said housing aft of said impellers for removing a compressible gas from said working chambers.

4,797,078

BEARING ARRANGEMENT OF AN EXTERNAL-AXIAL ROTARY PISTON BLOWER

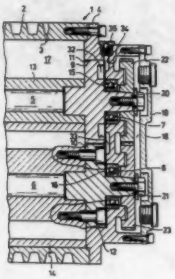
Werner Schubert, Lindau, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 58,922

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619645

Int. Cl.[4] F04C *10/18*

U.S. Cl. 418—206 1 Claim



1. A bearing arrangement of an axial rotary piston blower including transmission gear means therewith and provided for gaseous medium with a housing consisting of an interior runway surface and two side plates and forming working chambers with pistons rotating therein, whereby shafts upon which said pistons are mounted have shaft ends journaled by ball bearings with face seals laterally outside and extending radially in a location axially immediately adjacent to one side thereof for sealing-off of gas pressure in the working chambers, said bearings also having bearing collar means adjoining said shaft ends for mounting of said bearings and said transmission gear means of said blower located externally of said bearings, said arrangement comprising:

annular groove means which are open in a direction extending radially outwardly around said bearing collar means of ball bearings of said shafts of the pistons;

radially located walls provided on a transmission gear means side of said annular groove means opposed to inner recess edges of the transmission gear means forming therewith an annular gap of closest narrow tolerance extending axially therebetween;

means forming axial bores for said shaft ends as well as axial hubs of said transmission gear means and further annular gaps provided coaxially internally with respect to said axial bores for said shaft ends located in the bearing collar means axially relative to said axial hubs of said transmission gear means therewith;

a width in a range of a tenth to a twentieth millimeter being provided for the annual gaps axially between the radially located wall on the transmission gear means side thereof and the inner recess edges of the transmission gear means respectively as well as for the further annular gaps axially between the bearing collar means and the axial hubs of the transmission gear means;

an annular chamber means formed and arranged extending radially on a side laterally of one end plate of one shaft on a side toward the side plate, said annular chamber means communicating via a centrally located passage with gap chambers between the other end plate of the shaft and the adjoining side plate; and

a check valve in communication with gap chambers via a radially outwardly extending bore in the side plate.

4,797,079

APPARATUS FOR MAKING A THERMOPLASTIC MONOFILAMENT OF EXACT THICKNESS

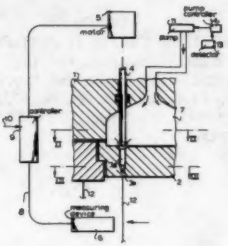
Hermann Balk, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 874,280, Jun. 13, 1986. This application May 28, 1987, Ser. No. 55,466

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521571

Int. Cl.[4] B29C *47/92*

U.S. Cl. 425—140 1 Claim



1. An apparatus for making a plurality of thermoplastic monofilaments each of an exact diameter comprising:

a horizontal spinning plate having an array of spinning orifices;

a spinneret housing above said spinning plate and defining therewith a distribution chamber communication with all of said orifices for delivering a thermoplastic material to said orifices for the formation of individual thermoplastic monofilaments thereby;

at least one spinning pump for feeding said thermoplastic material to said chamber and communicating with said chamber through an opening formed in said housing centrally of said array of spinning orifices;

a respective rod-shaped movable stopper above said plate and formed with a valve head defining a variable flow passage at an upper edge of each of said orifices and regulating by up and down movement relative to said plate, a flow of the thermoplastic material through the respective orifice, said stoppers extending upwardly through said chamber and emerging from said housing at an opposite side of the chamber from said plate;

a respective positioning motor operatively connected to each of said stoppers at said opposite side of said chamber for moving said the respective stopper up and down to control said flow;

a respective device positioned for measurement of an actual value of the diameter of each individual one of said thermoplastic monofilaments and generating an actual value signal corresponding to the measured actual value;

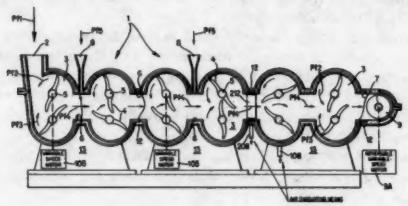
a control circuit connected to each of said devices, receiving said actual value signal and provided with a setpoint input representing a desired diameter of said monofilaments for comparing the respective actual value with the setpoint value, said control circuit being connected to each positioning motor for shifting the respective stopper in response to the comparison of the respective actual value with said setpoint value.

4,797,080

CONTINUOUS KNEADING MACHINE

Peter Wanninger, Heitersheim, Fed. Rep. of Germany, assignor to IKA-Maschinenbau Janke & Kunkel GmbH & Co. KG, Staufen, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 868,264
Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519349; European Pat. Off., Feb. 6, 1986, 86101551.9
Int. Cl.[4] H01J *17/00*
U.S. Cl. 425—203 24 Claims



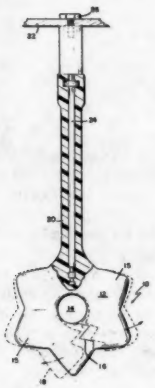
1. A kneading machine comprising a housing having an at least substantially horizontal row of at least three communicating neighboring kneading chambers including a first chamber and a last chamber, said first chamber having a charging opening for admission of the material to be kneaded and said last chamber having an evacuating opening for kneaded material; first and second substantially axially parallel rotary kneading members provided in each of said chambers; means for rotating the first and second kneading members in opposite directions; and a driven worm provided in said evacuating opening.

4,797,081

MANDREL FOR MAKING ELASTOMERIC ARTICLES

Ronald E. Prater, 3432 N. Washington Rd., Fort Wayne, Ind. 46804

Filed Mar. 10, 1987, Ser. No. 24,067
Int. Cl.[4] B29C *67/24*
U.S. Cl. 425—275 21 Claims



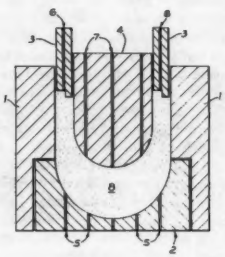
1. A one-piece mandrel, suitable for making a thin-walled elastomeric article by a dipping process, said mandrel comprising a one-piece body having at least one opening therein and a split extending from the opening through a cross-section of the one-piece body, at least a portion of said body being formed of an elastically resilient material such as to allow the split to open for removal of the elastomeric article after formation thereof, and substituted to cause the split to automatically close after removal of the elastomeric article from the mandrel to form a substantially continuous surface of the mandrel in the vicinity of the split, and wherein a portion of said one-piece body extends generally radially outwardly from said body, said portion having means for mounting the mandrel to a dipping apparatus.

4,797,082

APPARATUS FOR FORMING SHAPED PIECES OF INSULATION

John T. Hughes, Worcester, United Kingdom, assignor to Micropore International Ltd., Worcs., United Kingdom

Division of Ser. No. 894,496, Aug. 4, 1986. This application Apr. 28, 1987, Ser. No. 43,544
Claims priority, application United Kingdom, Aug. 16, 1985, 8520564
Int. Cl.[4] A01J *21/00*
U.S. Cl. 425—356 8 Claims



1. An apparatus for forming shaped pieces of insulation having a non-uniform thickness in the direction of compression thereof but substantially uniform density, which apparatus comprises:

a die for receiving a compressible flowable particulate material, which die comprises side walls and a base;

first and second plungers movable within the die;

means for moving the first and second plungers within the die in a first stage, said plungers being moved simultaneously so as to compact the insulation material and to cause the insulation material to flow and to become distributed within the die in an homogeneous manner, and subsequently in a second stage, means to move said plungers simultaneously and through different distance stroke cycles so as to compact and consolidate first and second portions of the insulation material in an independent manner so as to form a shaped piece of insulation in which first and second portions have different thicknesses in the direction of compaction but the degree of compaction of the first portion is the same as the degree of compaction of the second portion so that the shaped piece of insulation has substantially uniform density;

means for causing the strokes of the first and second plungers to vary dependent upon the density change of the insulation of the respective portion; and

means for permitting the escape of gas from within the die.

4,797,083

EXTRUSION DIE FOR MAKING A FOAMED THERMOPLASTIC WEB

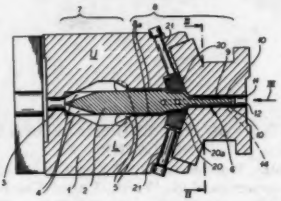
Hans Reifenhäuser, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,892

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3615994

Int. Cl.[4] B29C 47/12, 47/90

U.S. Cl. 425—378.1 4 Claims



1. In an extrusion die connectable to an extruder for making a thermoplastic foam web formable into a thermoplastic foam mat or a thermoplastic foam plate comprising a block and a flow-splitting and flow-displacement body in said block, said block including an inlet duct, two feed passages connectable to said inlet duct, two transversely widened gaps connectable to said feed passages and an outlet duct, said flow-splitting and flow-displacement body having a mounting portion and a guide portion, said body being downstream of said inlet duct in said block separating both of said feed passages and said transversely widened gaps with said guide portion and projecting with a sword-like tongue of said guide portion into said outlet duct to form two outlet gaps and an inner expansion chamber upstream of a mouth of said outlet duct, the improvement wherein said flow-splitting and flow-displacement body is plate-like, supporting rib-free and is held fixed from above and below by said mounting portion, said sword-like tongue of said body has sides running in a flow direction of a thermoplastic feed, said sides being set back from lateral interior walls of said block to form two lateral gaps whose width corrresponds approximately to a width of said outlet gaps, said thermoplastic material surrounding said sides of said sword-like tongue, said feed passages extend from said mounting portion to said guide portion, a plurality of flow control members positioned in said block in a throttling passage between said transversely widened gaps and said outlet gaps, said flow control members supported in said block and adjustable with the aid of an adjusting element toward said flow-splitting and flow-displacement body, and at least said sword-like tongue of said flow-splitting and flow-displacement body has a temperature-control passage system distributed over the length and breadth of said sword-like tongue which is connected with a plurality of lateral connecting tubes for feeding and removing a temperature-control medium upstream of said sword-like tongue.

4,797,084

MOLD DEVICE FOR MOLDING A PREFORM

Yoshinori Nakamura; Kouhei Koga; Satoru Kosuge, and Yoshihiro Fukunishi, all of Hanishina, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Filed Nov. 24, 1986, Ser. No. 934,196

Claims priority, application Japan, Nov. 29, 1985, 60-270029; Oct. 31, 1986, 61-260373

Int. Cl.[4] B29C 45/06, 49/36

U.S. Cl. 425—533 14 Claims

1. An injection molding machine, comprising:

a machine bed and a bed plate vertically spaced from and extending generally horizontally above the machine bed;

a plurality of horizontally spaced injection stages including a preform molding stage for molding a preform of an article and an orientation and blow molding stage for blow molding the preform into an article;

a rotatable transfer plate disposed below the bed plate and effective for transferring an article being molded from stage to stage;

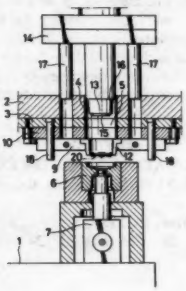
a cavity mold, stationarily supported on the machine bed at the preform molding stage, for molding the preform;

an opening in the transfer plate and another opening in the bed plate projecting above the cavity mold, the respective openings in the bed plate and in the transfer plate being alignable with one another;

a mold supporting plate disposed below the transfer plate and projecting above the preform molding stage, the mold supporting plate having a molding opening therethrough;

a retaining and lip mold supported in the molding opening in the mold supporting plate and movable with the mold supporting plate;

means for vertically moving the mold supporting plate toward and away from the cavity mold, the means for



moving the mold supporting plate including spring members for biasing the mold supporting plate and the retaining and lip mold toward the transfer plate and including vertically disposed shafts projecting from a lower surface of the transfer plate for guiding the mold supporting plate thereon, the spring members being mounted on the vertically disposed shafts;

the vertical shafts having upper connecting plates which are integrated into and supported on the transfer plate, a flange disposed on opposed ends of the vertical shafts and the spring members being disposed between the flanges and the mold supporting plate;

a vertically movable core mold movable vertically along the openings in the bed plate and in the transfer plate and into the retaining and lip mold, the injection molding machine being so structured that the retaining and lip mold is movable to abut the cavity mold and the core mold is movable into the retaining and lip mold to define the preform; and

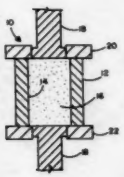
means for injecting resin into the cavity mold to mold a preform of an article.

4,797,085

FORMING APPARATUS EMPLOYING A SHAPE MEMORY ALLOY DIE

Tien-Hon Chiang, El Toro, and Donald N. Thatcher, Santa Ana, both of Calif., assignors to Aerojet-General Corporation, La Jolla, Calif.

Continuation-in-part of Ser. No. 938,204, Dec. 4, 1986, Pat. No. 4,738,610. This application Apr. 3, 1987, Ser. No. 33,664
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] B30B *12/00*
U.S. Cl. 425—405.2 **15 Claims**



1. An expansion forming apparatus comprising:

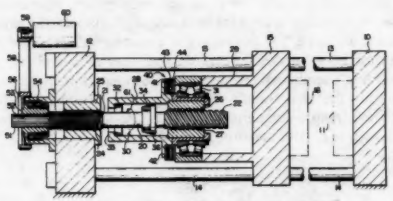
an outer die of generally cylindrical shape and having an interior cavity for receiving material to be formed, and an inner die also of generally cylindrical configuration and positioned within said cavity in substantially contiguous engagement with said material, the inner die being made of a shape memory alloy for compression of said material between said inner die and said outer die in response to heat applied to said apparatus for selectively causing transformation of said alloy between a martensitic phase and its parent phase for selectively increasing the outer radial dimension of said inner die.

4,797,086

APPARATUS CLUTCH CONTROLLED CLOSURE MEANS FOR A MOLDING

Taira Adachi, Sakura, Japan, assignor to Sumitomo Heavy Industries Ltd, Tokyo, Japan

PCT No. PCT/JP86/00585, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/02931, PCT Pub. Date May 21, 1987
PCT Filed Nov. 17, 1986, Ser. No. 86,127
Claims priority, application Japan, Nov. 18, 1985, 60-258320; Apr. 21, 1986, 61-91742; Jun. 24, 1986, 61-147675
Int. Cl.[4] B29C *45/64*
U.S. Cl. 425—589 **7 Claims**



1. A molding machine which is arranged to perform molding by means of at least one mold constituted by a pair of mold parts, comprising:

a stationary frame;

a fixed platen holding one of said pair of mold parts;

a movable platen holding the other of said pair of mold parts, said movable platen being attached to said stationary frame for reciprocal movement with respect to said fixed platen in a direction toward and away from said one of said pair of mold parts;

a shaft having an axis extending toward said movable platen, said shaft being supported for rotation with respect to said stationary frame and for reciprocal movement along said axis of said shaft, said shaft having first and second threaded portions formed thereon along said axis of said shaft;

an electrical motor mounted on said stationary frame for causing rotation of said shaft;

first and second nut members screwed onto said respective first and second threaded portions of said shaft, said first nut member being secured to one of said stationary frame and said movable platen, said first nut member and said shaft being movable with respect to each other when said shaft is rotated, said second nut member capable of being rigidly coupled with the other of said stationary frame and said movable platen; and

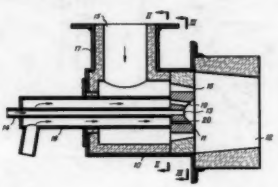
clutch means disposed between said other of said stationary frame and said movable platen and said second nut member for free movement between an engagement position which allows for relative movement between said shaft and said second nut member while said shaft is being rotated with said second nut member rigidly coupled with said other of said stationary frame and said movable platen and a disengagement position which allows said shaft to be rotated together with said second nut member while said shaft is being rotated with said second nut member released from rigid coupling with respect to said other of said stationary frame and said movable platen.

4,797,087

METHOD AND APPARATUS FOR GENERATING HIGHLY LUMINOUS FLAME

Grigory M. Gitman, Duluth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 755,831, Jul. 15, 1985, Pat. No. 4,642,047, which is a continuation-in-part of Ser. No. 642,141, Aug. 17, 1984, Pat. No. 4,622,007. This application Jul. 9, 1986, Ser. No. 883,769
Int. Cl.[4] F23M *3/04*
U.S. Cl. 431—10 **32 Claims**



1. A method of combusting combustible material in a burner having a combustion tunnel with an outlet opening to generate a high temperature, high luminosity flame, comprising the steps of:

separately supplying combustible material, a first oxidizing gas having a given oxygen concentration, and a second oxidizing gas having a different oxygen concentration from said first oxidizing gas to the burner;

separately directing said first oxidizing gas and a first portion of said combustible material into said combustion tunnel such that said portion of said combustible material and said first oxidizing gas mix at least partially within said combustion tunnel to create a hot oxygen lean luminous flame core;

separately directing the remainder of said combustible material and said second oxidizing gas into said combustion tunnel such that said remainder of said combustible material and said second oxidizing gas mix at least partially

within said combustion tunnel to create at least one oxygen rich mixture stream; and

mixing said oxygen lean flame core with said at least one oxygen rich mixture stream to create a final highly luminous flame pattern extending out of said combustion tunnel.

12. A burner for combustion of combustible material to generate a high temperature, high luminosity flame which comprises:

a combustion tunnel having an outlet opening;

means for separately supplying combustible material, a first oxidizing gas having a given oxygen concentration, and a second oxidizing gas having a different oxygen concentration from said first oxidizing gas to the burner;

first means for separately directing said first oxidizing gas and a first portion of said combustible material into said combustion tunnel such that said portion of combustible material and said first oxidizing gas mix at least partially within said combustion tunnel to create a flame core;

second means for separately directing the remainder of said combustible material and said second oxidizing gas into said combustion tunnel such that said remainer of combustible material and said second oxidizing gas mix together at least partially prior to mixing with said flame core; and

means for causing said mixture of combustible material and said second oxidizing gas to subsequently mix with said flame core to create the final flame pattern.

4,797,088

SAFETY DEVICE FOR OIL BURNER

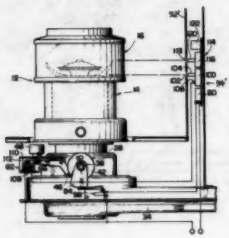
Kazuharu Nakamura, Aichi; Yoshio Mito, Gifu; Yutaka Nakanishi, Aichi; Toshihiko Yamada, Aichi, and Yuji Sanada, Aichi, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Apr. 29, 1986, Ser. No. 857,013

Claims priority, application Japan, Apr. 30, 1985, 60-93445; Nov. 12, 1985, 60-254513

Int. Cl.[4] F23N *5/24*

U.S. Cl. 431—15 **35 Claims**



1. A safety device for an oil burner comprising:

an abnormal combustion sensing and actuation mechanism arranged to receive heat rays emitted from a combustion cylinder construction of said oil burner to detect abnormal combustion which occurs in said oil burner after a normal combustion forming a combustion flame emitting heat rays of at least a predetermined intensity and which forms an excessively decreased flame sufficieat to produce incomplete combustion gas; and,

a starting means for starting a fire-extinguishing device of said oil burner, said starting means being operatedly connected to said abnormal combustion sensing and actuation mechanism so as to be actuated to operate said fire-extinguishing device when said abnormal combustion sensing and actuation mechanism detects said abnormal combustion occuring after said normal combustion, said abnormal combustion sensing and actuation mechanism including means for preventing said actuation of the starting means for a period of time after ignition of the oil burner sufficient to provide said normal combustion.

4,797,089

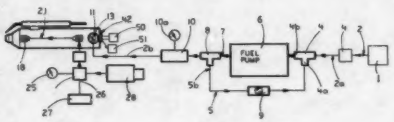
SYSTEM CONTROL MEANS TO PREHEAT WASTE OIL FOR COMBUSTION

Gary Schubach, 4805 S. Farr Rd., Spokane, Wash. 99206, and Frank Schubach, N. 1406 Aladdin Rd., Greenacres, Wash. 99016

Filed Jun. 22, 1987, Ser. No. 65,919

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—28 **4 Claims**



1. A waste oil burner feed system apparatus for preheating and then controlling the temperature of fuel oil for the air pressure driven atomization of the fuel oil in cooperation with a waste oil burner, comprising:

a heat transfer assembly which includes a helical oil passageway through an elongated aluminum heat transfer body, which receives heat from a heating element operatively connected to it, and which distributes the heat to fuel oil within its helical oil passageway;

an oil supply line in constant communication with the helical oil passageway in the heat transfer assembly and consequently in constant communication with an atomization nozzle which is securable at a terminal end of the heat transfer assembly;

an oil expansion and pressure relief means to prevent expanding fuel oil from passing through the atomization nozzle on cold startup and prior to the fuel oil attaining a temperature of a pre-selected value by means of associated configuration of the heat transfer assembly in cooperation with the atomization nozzle and an adjacent air supply inlet and an air supply line in constant communication therewith;

a system control means for cold startup to energize only the heating element, until the heat transfer assembly adjacent to the atomization nozzle attains a temperature of a preselected value, at which time said system control means energizes a fuel oil pump means, energizes an air pump, and energizes a means of igniting the atomized fuel oil exiting the aperture of the atomization nozzle; and

an air supply line and an air supply inlet means operatively secured to the heat transfer assembly adjacent the atomization nozzle for providing a pre-selected pressure for atomization of the fuel oil during operation and for accepting therein expanding oil and associated pressure from within the heat transfer assembly prior to the expanding oil attaining a temperature of said pre-selected value and during said cold startup.

4,797,090

CANDLE LANTERN APPARATUS

H. Gardner Rogers, 20 Newton St., Weston, Mass. 02193

Filed Jun. 12, 1987, Ser. No. 62,164

Int. Cl.[4] F23D *3/16*

U.S. Cl. 431—290 **19 Claims**

1. A candle apparatus, comprising

candle means, including a spiral candle element, for providing a flame at a first burning end of said element,

base means for supporting said candle means, and

hinge means rotatably connected between said candle means and said base means for supporting said candle means in a

substantially vertical plane, for rotation of said candle means with respect to said base means under the influence of gravity, so that as said first end burns, said candle means

rotates due to the influence of gravity and said flame remains at a substantially constant angular relationship with respect to said base means.

4,797,091

METHOD AND APPARATUS FOR UTILIZING THE HEAT ENERGY OF DOMESTIC AND COMMERCIAL REFUSE

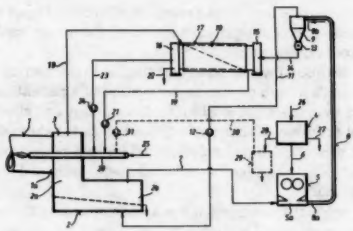
Eberhard W. Neumann, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 163,085

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708220

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—14 **16 Claims**



1. Method of utilising the heat energy of domestic and commercial refuse in a kiln installation containing a kiln and a cooler arranged after the kiln, especially for the manufacture of mineral structural materials, in which

(a) a light fraction is sorted out of the crude refuse as so-called fluff, is crushed and fed as prepared valuable material to a pyrolysis reactor in which this valuable material is degassed with air excluded and heat delivered, yielding pyrolysis gas and pyrolysis residues.

(b) the pyrolysis gas is delivered to the main burner of the kiln, optionally with the additional use of primary fuel,

characterised by the following features:

(c) in order to obtain the valuable material, at least the crushed fluff is dried pneumatically to a dry substance content of at least approximately 78%, preferably approximately 88–92%, in a hot gas stream which is preferably branched off from the cooler of the kiln installation;

(d) the valuable material thus obtained is fed to the pyrolysis reactor and degassed at low temperature, the pyrolysis reactor being indirectly heated with hot secondary air taken from the region of the junction between the kiln and the cooler and/or combustion gases from an auxiliary firing system or from the kiln;

(e) the pyrolysis gas produced in the pyrolysis reactor, any quantity of primary fuel which may be necessary and the secondary air utilised for the indirect heating of the pyrolysis reactor are delivered to the main burner of the kiln.

4,797,092

CULLET PREHEATER

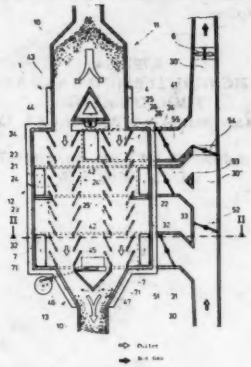
Helmut Pieper, Lohr/Main, Fed. Rep. of Germany, assignor to Nikolaus Sorg GmbH & Co. Kg, Lohr/Main, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,171

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3626076

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—95 **8 Claims**



1. In a preheater for cullet, in which hot gas coming from a hot gas supply duct can be passed through the cullet while yielding heat to the latter and can be carried away through a hot gas exhaust duct, and wherein the cullet is guided between guiding walls forming a cullet shaft and permitting has entry as well as gas exit, the improvement comprising: said cullet shaft has at least two cullet shafts each defined by two approximately parallel guiding walls, the two outer guiding walls being fixed and the two inner guiding walls being spaced from one another forming a hot-gas gap and are combined into a single movable central body, said central body being pivotingly suspended at its upper end; and moving means for repeatedly moving at least one of the guiding walls laterally relative to another guiding wall so as to change the spacing between them by continuously or periodically impart a switching or shaking movement to the central body, said moving means including an unbalanced or eccentric drive.

4,797,093

MUSCULAR EXPANSION BUMPER AND HEAD-GEAR APPLIANCE

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Oct. 19, 1987, Ser. No. 109,938

Int. Cl.[4] A61C *7/00*

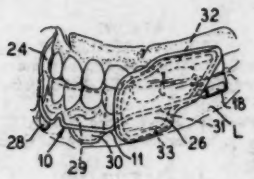
U.S. Cl. 433—5 **15 Claims**

1. A muscular expansion bumper appliance comprising:

a wire form member having a generally U-shaped configuration having a central bight portion with two free posterior ends,

at least one additional wire segment secured on a lateral side of at least one of said free posterior ends of said wire form member, said wire segment configured into a generally geometrical parallelogram shape, and

a side pad comprising a moldable material molded onto and carried by said wire segment and together with said wire



segment forming a selectively deformed side pad to permit desired expansion.

4,797,094

ORTHODONTIC WIRE TERMINAL AND ATTACHMENT TOOL THEREFOR

Thaddeus M. Karwoski, 5420-B Roundtree Ct., Concord, Calif. 94521

Filed Dec. 7, 1987, Ser. No. 129,480
Int. Cl.[4] A61Q 7/00
U.S. Cl. 433—22 **8 Claims**

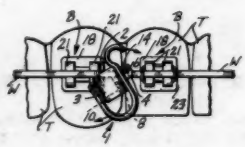
1. A terminal cap for reducing injury to a patient from the sharp ends of orthodontic wires, said terminal cap comprising:
a small domelike body having a first hole therethrough for accommodating the end of the orthodontic wire, and
A set screw threaded into a secod hole substantially normal to and intercepting said first hole in said body, said set screw for removably securing said body to said orthodontic wire.

4,797,095

ORTHODONTIC HOOK MOUNTING

Maclay M. Armstrong, Seattle; Steven A. Houser, Edmonds, and Jeffrey A. Armstrong, Mercer Island, all of Wash., assignors to Unitek Corporation, Monrovia, Calif.

Continuation-in-part of Ser. No. 609,409, May 11, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 834,288
Int. Cl.[4] A61C 3/00
U.S. Cl. 433—22 **20 Claims**



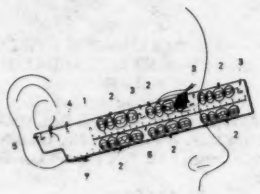
1. A mounting for an orthodontic hook or the like capable of being installed on an arch wire and tooth bracket assembly comprising a front member for positioning in front of an arch wire and tooth bracket, a pair of generally parallel rear prongs disposed generally parallel to said front member for straddling the body of a tooth bracket behind the arch wire of the assembly when said prongs are disposed substantially parallel to the arch wire, crosstie means supporting and spacing said rear prongs from said front member in a position projecting from said crosstie means, and rearwardly-opening slot means alongside said crosstie means for receiving the arch wire only when said prongs are not substantially parallel to the arch wire to enable movement of said rear prongs from a position in front of the arch wire to a position behind the arch wire.

4,797,096

MEASURING TOOL FOR THE SELECTION OF ARTIFICIAL TEETH

Toshio Ito; Takashi Miwa, and Fujio Yamagishi, all of Kasugai, Japan, assignors to G-C Toshi Kogyo Corporation, Kasugai, Japan

Filed Jan. 14, 1987, Ser. No. 3,145
Claims priority, application Japan, Jan. 29, 1986, 61-10250[U]; Oct. 23, 1986, 61-252426
Int. Cl.[4] A61C 19/04
U.S. Cl. 433—26 **10 Claims**



1. A measuring tool for the selection of artificial teeth having a full-scale mesiodistal highest position of contour, said measuring tool comprising:
(a) a flexible substrate sized and shaped to be inserted into a patient's mouth or into an impression of a patient's mouth and to contact the existing teeth or gingiva to allow easy and accurate selection of artificial teeth for that patient:
(b) at least the full-scale mesiodistal highest position of contour of a plurality of artificial teeth indicated on said substrate;
(c) a product classification mark corresponding to the full-scale mesiodistal highest position of contour of said plurality of artificial teeth indicated on said substrate;
(d) a scale located at an interval of 13 mm for determining the average condyle indicated on said substrate; and
(e) a scale for judging the angle that the occlusal surface makes with the interalveolar ridge line indicated on said substrate.

4,797,097

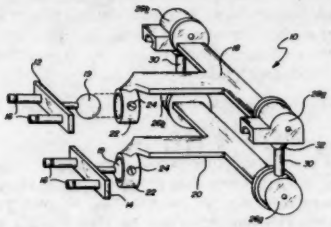
ARTICULATOR FOR DENTAL MODEL

Moritz Cohn, 26100 Orchard Lake Rd., Farmington Hills, Mich. 48018

Filed Apr. 15, 1987, Ser. No. 38,821
Int. Cl.[4] A61C 11/00
U.S. Cl. 433—64 **11 Claims**

1. A dental articulator for hingedly retaining a pair of dental castings, said articulator comprising:
a pair of attachment members, each adapted to engage one of said castings, and,
a hinge unit including two pivotally interconnected retaining members, each adapted to pivotally engage one of said attachment members by means of at least one ball and socket joint, the socket of which includes a locking screw for selectively and reversibly immobilizing said joint;
said hinge unit further including a hinge connection which
(a) provides a pair of pivot axes disposed in spaced-apart

parallel relationship, each retaining member adapted to pivot about one of said axes, and which (b) provides for



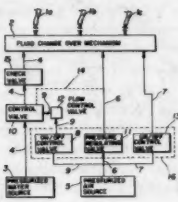
the ready and reverible separation of said retaining members.

4,797,098

APPARATUS FOR DENTAL TREATMENT PROVIDED WITH CHECK VALVE IN FLUID PASSAGE

Shosaku Kwata, Kanuma, Japan, assignor to Nakanishi Dental Mfg. Co., Ltd., Japan

Filed Apr. 22, 1987, Ser. No. 41,090
Int. Cl.[4] F27D *1/08*
U.S. Cl. 433—98 **4 Claims**



1. A dental treatment apparatus comprising:

a pressurized fluid source for pressurizing and supplying fluid to perform dental treatment operation;

fluid passage means for supplying said fluid pressurized to a dental treatment tool provided to the extreme end of a dental handpiece;

suction means interposed between said pressurized fluid source and said handpiece and adapted to stop the flow of said pressurized fluid and to suck the fluid in a direction opposite to a supplying direction of said fluid when said dental treatment operation is terminated; and

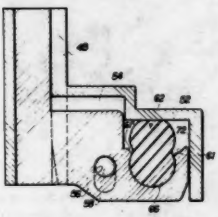
check valve means interposed in said fluid passage means between said suction means and said dental treatment tool, said check valve means including a resilient valving member and a through-slit formed in said valving member, said slit being extended apart under pressure to permit the fluid to pass therethrough when said pressurized fluid is conveyed through said check valve means during said dental treatment operation, said through-slit being closed by the resiliency of said valving member to inhibit the fluid lying between the check valve and the dental treatment tool from being sucked towards said suction means when said dental treatment operation is terminated.

4,797,099

RESILIENT DENTURE CONNECTING DEVICE

Melvin D. Poveromo, 14135 N. Miami Ave., Miami, Fla. 33168

Filed Feb. 16, 1988, Ser. No. 156,120
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—169 **12 Claims**



1. A resilient denture connecting device having a proximal end and a distal end, a male-female attachment means to connect the device to an abutment tooth **12**, said attachment means having a surface facing the gingival tissue **14** and a distally facing abutment surface **50**,

said attachment means including a distally extending rigid shank **18** adjacent the surface of the attachment means which faces the gingival tissue,

said shank **18** having an upper surface **20** and a lower surface **22**, said distal surface **16** and a pair of side surfaces **24–26** and including a distal portion **28** and an intermediate portion **30**,

a housing **32** having a roof **38** with an upper surface, a distal wall **40** with a distal surface, a pair of opposing side walls **42–44** and mouth in an open bottom **46**, said housing being sized to receive the shank with the side walls of the housing **42–44** confronting the side surfaces **24–26** of the shank,

said housing including a proximal face plate **48** in a normal position in abutting relation to the distally facing surface **50** of said attachment means,

said housing having a distal cavity portion **52** extending proximately from the distal wall **40** and an intermediate cavity portion **54** between the face plate **48** and the distal cavity portion **52**,

pivot means interconnecting the side walls of the housing and the intermediate portion of the shank, said intermediate portion of the shank having a through recess **56** which is elongated toward the lower surface of the shank, and said pivot means including a pin **58** in the through recess **56** effective to permit hinged movement of the housing relative to the shank from said normal position of the face plate and vertical movement of the housing **32** relative to the shank upon movement of the pin vertically in the recess **56**,

said upper surface **20** of said shank including an intermediate portion spaced from the housing roof **38** a predetermined distance of between 0.4 and 0.6 millimeters,

the upper surface **20** of said distal portion **28** of the shank **18** being spaced beneath the housing roof **38** and having a recess **60** in the upper surface **20** of the shank **18**,

resilient means **62** captivated in the recess **60** and with a portion **64** at all times in engagement with the housing **32** normally biasing the housing **32** into the normal position, when said male-female attachment means connect the device to an abutment tooth,

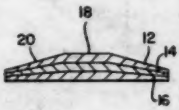
said resilient means being effective to permit vertical movement of the housing simultaneously with hinged movement of said housing through said predetermined distance and said resilient means being effective to reboundingly restore the housing when masticating loads are cyclically relieved.

4,797,100

METAL FOIL FOR FORMING A DENTAL COPING

Itzhak Shoher, 50 Shlomo-Hamelech St., Tel-Aviv, Israel 64386, and Aharon E. Whiteman, 13 J. L. Perez St., Petach-Tikvah, Israel 49206

Filed Jun. 1, 1987, Ser. No. 56,054
Int. Cl.[4] A61C *5/08*
U.S. Cl. 433—222.1 10 Claims



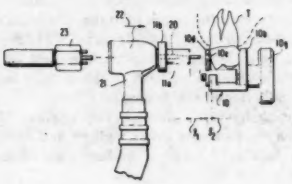
1. A metal foil for forming a dental coping in the construction of a ceramic or acrylic to metal dental restoration in which the coping represents the metal understructure of the dental restoration and is sized for adaptation to fit the tooth to be restored, comprising two or more layers of precious metal having a circular disk like shape with at least one layer of high fusing temperature metal and at least one layer of low fusing temperature metal and with said metal foil having a central area forming the occlusal surface of the coping and a cross section with a variable thickness extending from the central area to the periphery of the foil.

4,797,101

DENTAL IDENTIFICATION SYSTEM

Alvan Morris, 7148 Loch Lomond Dr., Bethesda, Md. 20817

Filed Mar. 11, 1987, Ser. No. 24,487
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—229 13 Claims



1. A method of enabling photographic identification of a human subject by use of a camera having a lens of predetermined fixed focal length, comprising the steps of

placing a clamp on the tooth of a human subject to be identified to establish a reference plane that is generally parallel to and spaced outwardly from a buccal face of said tooth;

inserting an end-cutting burr into a dental hand piece;

adjusting the position of said burr in said hand piece so that the burr protrudes outwardly of said hand piece by a predetermined fixed distance that is related to the fixed focal length of the camera lens which is to be used in effecting said photographic identification, said adjusting step being effected by placing an elongated cylindrical spacer onto said burr in surrounding relation to said burr and thereafter varying the position of said burr in said handpiece by a distance which is equal to the length of said cylindrical spacer, plus the distance between said reference plane and said tooth face established by said clamp, plus a predetermined depth of a recess that is to be drilled into said tooth face;

positioning the hand piece relative to said clamp with said spacer on said burr and with the burr so adjusted thereafter moving said hand piece toward said tooth face and clamp until the end of the spacer remote from the hand piece engages an outer surface of said clamp so as thereby to drill a recess of said predetermined depth into said tooth face; and

placing a microdot bearing identifying information thereon at the bottom of said recess and securing said microdot in place thereby to fix said microdot in place at a location that is spaced inwardly of the buccal face of the tooth by a precise distance that is related to said fixed focal length of the camera lens.

4,797,102

INSTRUCTIONAL GLOBE

Maria K. Forsyth, 63 Sterling Pl., W. Boylston, Mass. 01583

Continuation of Ser. No. 642,649, Aug. 20, 1984, Pat. No. 4,595,367. This application Jun. 16, 1986, Ser. No. 874,608
Int. Cl.[4] G09B *27/08*
U.S. Cl. 434—147 14 Claims

1. An instructional globe comprising:

(a) a globe-shaped body;

(b) a plurality of preformed spherical surface segments, the spherical surface of each segment structurally representing a portion of a geographical globe surface;

(c) detachably interengageable means on the globe-shaped body for removably attaching each spherical surface segment to the globe-shaped body at a pre-established position; and

(d) a plurality of cues formed on the globe-shaped body, each cue having a correspondence in shape to a set of said spherical segments whereby the placement of each of said segments in its respective pre-established position is facilitated, and wherein said cues comprise a plurality of indentations and wherein each of said spherical segments is geometrically similar in outline to a corresponding indentation.

4,797,103

LEARNING BOARD

Susan Pittman, Rte. 2 Box 353-AA, Lowell, Ark. 72745

Filed Nov. 23, 1987, Ser. No. 123,728
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—211 7 Claims

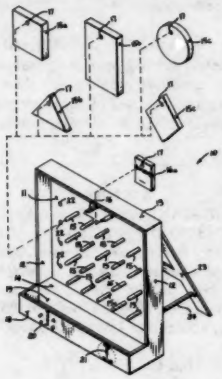
1. A learning board for learning concepts of color, geometric configuration, and counting comprising,

a board means formed with a matrix of blind bores for the selective positioning of a pre-determined matrix of support pegs within said bores,

plural sets of geometric configurations wherein each set includes a plurality of similar geometrically shaped elements, each set comprising a geometric shape of elements, each of said elements in said set formed of a unitary color and each set including a plurality of colors, and

peg means in overlying relationship to said matrix for the acceptance of pre-selected number cards, each of said number cards including a number thereon for determining the number of geometrical elements to be selected, and

random selector means for the selection of a particular geometric shape from among said sets of geometric shapes



and for the random selection of a color within the geometric set selected.

4,797,104

SYSTEM AND METHOD OF TESTING A PERSON IN THE PERFORMANCE OF CARDIOPULMONARY RESUSCITATION

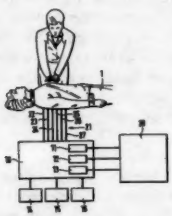
Tore Laerdal; Kjell Aamodth, and Harald Eikeland, all of Stavanger, Norway, assignors to Asmund S. Laerdal, Stavanger, Norway

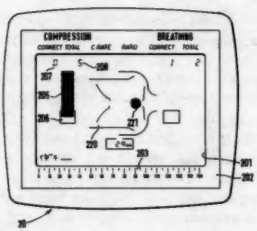
Filed Aug. 3, 1987, Ser. No. 81,317

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638192

Int. Cl.[4] G09B *5/02, 23/28*

U.S. Cl. 434—265 **15 Claims**





1. A system for testing a person in the performance of cardiopulmonary resuscitation (CPR) and for evaluating the correctness of a training exercise in CPR, including:

(a) a training device which simulates a patient, comprising at least one sensor for the output of parameter signals defining characteristic parameters for a resuscitation procedure to be carried out on the training device;

(b) a memory means for storing parameter values which define

(i) a parameter minimum value for the recognition of an operating procedure on the training device, as an attempt at a resuscitation procedure, and

(ii) upper and lower parameter limit values for the recognition of an operating procedure on the training device as a correct resuscitation procedure;

(c) a computer connected to the training device and the memory means for receiving the parameter signals from said at least one sensor, the computer being adapted to compare the parameter signals from the said at least one sensor to respective stored parameter values in the memory means thereby to detect the character of a resuscitation procedure in respect of correctness thereof, and

(d) a liquid crystal display means controlled by the computer for displaying a symbolic representation of the training device and a moving graphic representation of the parameter signals from said at least one sensor.

4,797,105

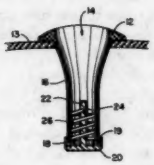
ONE-WAY BREATHING DEVICE

Curtis A. Green, 2520 Wellerman Way, Turlock, Calif. 95380

Filed Nov. 6, 1987, Ser. No. 117,325

Int. Cl.[4] G09B *23/28*

U.S. Cl. 434—265 **8 Claims**



1. A new and improved one-way breathing device for use with a CPR training mannequin having a mouth with lips, comprising:

hollow conduit means dimensioned for insertion into the mouth of the mannequin;

radially outwardly extending flange means at one end of said conduit means for engagement over the lips of the mannequin;

said flange means formed from a soft flexible material configured to resemble human lips and dimensioned for sealing conformance with the mannequin lips;

one-way valve means in said conduit for allowing air to be blown through said conduit means into said mannequin and for preventing air from returning through said conduit means from said mannequin; and

said conduit means tapering from a wide end adjacent said flange means to a narrow end adjacent said one-way valve means.

4,797,106

ELECTRONIC BLACKBOARD SYSTEM

Seiji Umehara, and Katsuyoshi Sakai, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,488

Claims priority, application Japan, Sep. 6, 1985, 60-197343; Sep. 6, 1985, 60-197344; Dec. 23, 1985, 60-287966

Int. Cl.[4] H04N *1/024*

U.S. Cl. 434—408 **11 Claims**

1. An electronic blackboard system for positioning in front of and in facing relationship with an existing information writ-

ing board to read information written on the board therefrom, said system comprising:

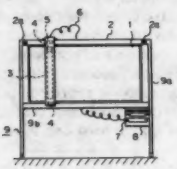
a pair of left and right struts;

a horizontal guide rail supported by said pair of struts;

said struts and guide rail forming a support unit that is disposed separated from and independent of said information writing board;

a drive means supported from said guide rail and including roller means for contacting said guide rail and to roll in contact with said guide rail;

a positioning roller means provided at the lower part of said drive means, said roller rolling in contact with an information writing surface of said information writing board;



a photoelectric conversion device attached to said drive means such as to face the information writing board and adapted to read written information in the form of lines and convert them into electrical signals, said photoelectric conversion device being moved by said drive means in the direction of intersecting said lines to obtain an image of the information written on the information writing board;

the positioning of said positioning roller means and support unit made so as to provide a uniform spacing between said photoelectric conversion device and information writing board writing surface;

a memory adapted to store said information image; and

a hardcopying device adapted to read out the information image contained in said memory and record it.

4,797,107

COPYABLE BLACKBOARD

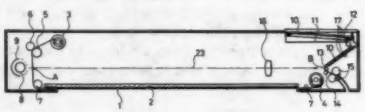
Naoyuki Hatta; Hideo Yoshihara; Takeshi Izaki; Akihiro Sawada; Takemi Yamamoto, and Kazuo Sangyoji, all of Nagoya, Japan, assignors to Brother Kogyo Kabushikikaisha, Aichi, Japan

Filed May 19, 1987, Ser. No. 52,865

Claims priority, application Japan, May 19, 1986, 61-113874; Dec. 29, 1986, 61-200788[U]; Jan. 13, 1987, 62-2429[U]; Jan. 23, 1987, 62-14817

Int. Cl.[4] H04N *1/10*

U.S. Cl. 434—408 **29 Claims**



1. A copyable blackboard comprising:

a written member on which is depicted a picture comprising data such as characters or figures;

first carrier means for carrying said written member;

light source for irradiating light to said picture on a portion of said written member to generate an optical signal corresponding to said picture, said portion being located at a predetermined position on said written member;

photosensitive member which receives said optical signal from said written member and thereby produces a corresponding latent image of said picture;

second carrier means for carrying said photosensitive member;

image developing means for developing said latent image of said photosensitive member on the photosensitive member itself; and

control means for controlling said first and second carrier means to control feeding speeds of said written member and said photosensitive member to values determined to correspond to a preselected picture reduction ratio and to also control said image developing means and said light source.

4,797,108

METHOD OF MANUFACTURING AMORPHOUS SILICON FIELD EFFECT TRANSISTORS

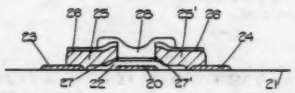
Simon N. Crowther, Basingstoke, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Division of Ser. No. 706,940, Mar. 1, 1985, abandoned. This application Dec. 10, 1986, Ser. No. 939,967

Claims priority, application United Kingdom, Mar. 10, 1984, 8406330

Int. Cl.[4] H01L *29/78*

U.S. Cl. 437—41 **4 Claims**



1. A method of manufacturing an amorphous silicon field effect transistor having component parts thereof formed on an insulating substrate, the component parts of said amorphous silicon field effect transistor including electrically conductive source and drain regions, a layer of intrinsic amorphous silicon provided in a space between said source and drain regions and in intimate electrical contact with said source and drain regions, source and drain electrodes in electrical connection with said source and drain regions respectively, a gate electrode adjacent said layer of intrinsic amorphous silicon, and a gate insulating layer separating said gate electrode from said layer of intrinsic amorphous silicon, said gate insulating layer contacting said source and drain regions, the method comprising the steps of:

forming source, drain and gate electrodes on an insulating substrate;

forming a gate insulating layer over said gate electrode;

forming a layer of electrically conductive doped amorphous silicon over said source and drain electrodes and over said gate insulating layer so as to be in direct contact therewith, said layer of electrically conductive doped amorphous silicon being destined to form said source and drain regions;

removing part of said layer of electrically conductive doped amorphous silicon to define therein respective source and drain regions which each contact the gate insulating layer and a respective one of said source and drain electrodes, and to define therein a space between said source and drain regions; and

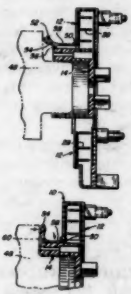
depositing a layer of intrinsic amorphous silicon in said space defined between said source and drain regions so as to bring said layer of intrinsic amorphous silicon into intiamte electrical contact with said source and drain regions and in contact with said gate insulating layer, points of contact of said layer of intrinsic amorphous silicon with said gate insulating layer corresponding to those points where said source and drain regions are closest to one another and in intimate electrical contact with said layer of intrinsic amorphous silicon.

4,797,109

COILED WIRE INTERCONNECTOR

Russell E. Wende, Oak Lawn, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Feb. 25, 1988, Ser. No. 160,342
Int. Cl.[4] H01R 35/00
U.S. Cl. 439—15 17 Claims



1. An electrical interconnector member which comprises: an outer housing defining a first aperture; a rotor member occupying said first aperture in rotational relation thereto; a first electrical connection carried on said outer housing; a second electrical connection carried on said rotor member; and coiled conductor means loosely coiled about said rotor member within said outer housing, said coiled conductor means being connected at respective ends thereof to said first and second electrical connections; the improvement comprising, in combination:

recess means carried by one of said outer housing and rotor member, and flexible detent means carried by the other of said outer housing and rotor member, said detent means being normally positioned to project into said recess means to inhibit rotation between said outer housing and rotor member when said interconnector member is not mounted on a device such as a vehicle steering column, said detent means being positioned and proportioned whereby mounting of said interconnector member for use on a device such as said vehicle steering column causes said detent means to be flexed out of projecting relation with said recess means, to permit rotation between the outer housing and rotor member.

4,797,110

PRINTED CIRCUIT BOARD WITH INTEGRAL ELECTRICAL CONNECTOR AND METHOD FOR MAKING IT USING WAVE SOLDERING

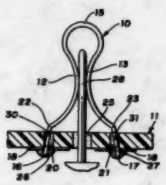
Richard L. Ponziani, Dayton; William E. Davies, Kettering, and Everett P. Trittschuh, III, Centerville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 906,125, Sep. 8, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,043
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—83 4 Claims

1. A printed circuit board assembly with a soldered integral connector adapted to receive a mating connector shaft with no solder blockage of the connector, the printed circuit board assembly comprising, in combination:

connector means comprising a single strip of electrically conducting metal having a pair of oppositely oriented concave legs joined at one end in a convex head providing a spring bias therefore with each concave leg having a narrow foot on its other end, the concave legs being spaced apart by a smaller distance at a closest point intermediate their one and other ends than at their other ends;

an insulating circuit board with a pair of mounting openings therethrough, a central access opening between the mounting openings and an electrically conducting printed circuit on one side thereof bordering at least one of the mounting openings, the mounting openings receiving the feet of the connector means inserted from the other side of the circuit board and being spaced apart by a distance (1) sufficiently small to force the concave legs toward each other against the bias of the convex head so that the feet are biased outward against walls of the mounting openings and so that the concave legs are adapted for physical and electrical at their closest point, with an engagement force precisely determined by the distance, of the mating connector shaft when inserted through the central access



opening, and (2) sufficiently great to maintain the feet apart in the openings to prevent the wicking of liquid solder by capillary action from the mounting openings or access opening between the concave legs on a wave soldering process; and

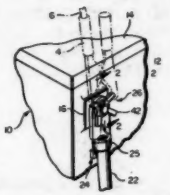
a solder connection in each of the mounting openings physically retaining the feet therein with at least one of the solder connections electrically connecting the connector means to the printed circuit, the solder connections not extending away from the circuit board between the concave legs and therefore not blocking access to the connector means by the mating connector shaft.

4,797,111

TERMINAL FOR SIDE-MOUNT BATTERY

Martin E. Ackmann, 851 Bode Rd., Elgin, Ill. 60120

Filed May 4, 1987, Ser. No. 45,532
Int. Cl.[4] H01R 11/01
U.S. Cl. 439—755 17 Claims



1. A battery terminal bolt for a side-mount electrical storage battery, comprising the combination of

a bolt having a threaded stem at one end and having an enlarged body at the opposite end;

a plurality of arms rigidly projecting radially from the bolt body at a location spaced from the threaded stem; and

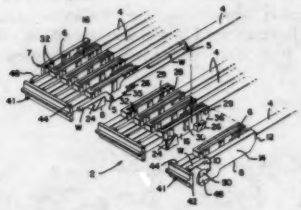
said bolt and arms being electrically conductive.

4,797,112

WIRE HOLDERS AND HARNESSES INCORPORATING WIRE HOLDERS

Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 4, 1987, Ser. No. 81,195
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—55 21 Claims



1. A wire holder for holding a plurality of discrete wires in an array in side-by-side parallel relationship, the wire holder comprising:

a frame having oppositely-facing first and second major surfaces, oppositely-facing first and second minor surfaces, and oppositely-facing ends, the major surfaces and the minor surfaces extending between the ends,

a plurality of parallel side-by-side wire-receiving cavities extending into the first major surface and extending through the frame from the first minor surface to the second minor surface, the cavities being in a row which extends between the ends, the cavities having wire retaining means therein for retaining wires inserted therein,

a wire guard for protecting the tip portions of the end portions of wires contained in the cavities, the guard extending beside, and being spaced from, the first minor surface, the wire guard comprising a bar like member which is connected to the frame, there being clearance space between the bar like member and the first minor surface for the reception of the tip portions of the end portions of wires held in the cavities, whereby,

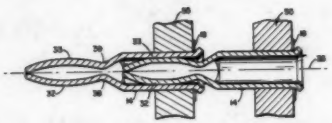
a discrete wire can be placed in one of the cavities by positioning the wire adjacent to the first major surface with the axis of the wire in alignment with the one cavity and with the tip portion of the end portion of the wire aligned with the clearance space, and thereafter moving the wire laterally of its axis and into the cavity so that the end portion of the wire is retained in the cavity with the tip portion of the end portion of the wire projecting from the first minor surface and into the clearance space.

4,797,113

BOARD TO BOARD FLEXIBLE PIN

Roger T. Lambert, 5164 St. Moritz Dr., Fridley, Minn. 55421

Filed Feb. 5, 1987, Ser. No. 11,030
Int. Cl.[4] H01R *13/28*
U.S. Cl. 439—74 9 Claims



7. A flexible pin for use in conjunction with another flexible pin comprising:

(a) a one-piece elongated sheet metal member having at least a first and a last portion defining a longitudinal axis;

(b) said first portion having a barrel shape in which the lateral edges thereof are bent towards each other until they are in close proximity to each other, and said first portion being constructed and arranged to receive and communicate with substantially all of another said last portion of another identical flexible pin;

(c) said last portion cantilevered integrally from said first portion and extending away from said first portion generally in the direction of said longitudinal axis, said last portion having a pair of cantilevered fingers disposed in confronting relationship, one of which is the mirror image of the other, each finger having a generally continuously arcuate cross-section in a plane parallel to said longitudinal axis in which the greatest transverse projection of said fingers is at least equal to the width of the inside diameter of said first portion; and

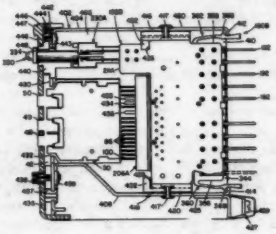
(d) a printed circuit board having a plurality of bores formed therein communicating with electrical circuits formed thereon, one of said bores receiving said first portioN of said flexible pin.

4,797,114

JACK CIRCUIT BOARD ASSEMBLY

Frederick L. Lau, Skokie, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Filed Mar. 2, 1987, Ser. No. 20,803
Int. Cl.[4] H01R *23/68*
U.S. Cl. 439—79 12 Claims



1. An electrical connector comprising:

an elongated first dielectric body having extended through its thickness a pair of longitudinally spaced aperatures, each being provided with an integral first latching device, and an interposed plurality of first contact receiving holes;

an elongated second dielectric body having a front surface and a rear surface defining an interposed thickness of said second dielectric body, said second dielectric body having its front surface interfaced with said first dielectric body and having extended through its thickness a plurality of second contact receiving holes, each being aligned with a respective first contact receiving hole, and said second body having a pair of longitudinally spaced portions from which respective integral second latching means extend into engagement with respective first latching devices for removably securing second body to said first body;

a plurality of electrical contact members having contact end portions disposed in respective first contact receiving holes in said first body and being extended integrally therefrom through said aligned second contact receiving holes in said second body, said electrical contact members having integral other end portions protruding from said rear surface of said second body; and

wall means extended from said rear surface of the second body with said protruding end portions of said electrical contact members for cooperating therewith in forming electrical connections with said connector through said electrical contact members, said dielectric wall means including means for mounting to a printed circuit board

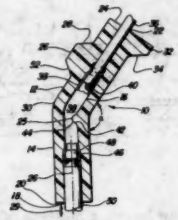
and disposing said contact members in electrically connectable relationship with conductors on said printed circuit board.

4,797,115

ANGLED BOOT FOR ANGLED SPARK PLUG CABLE TERMINALS

Ronald P. Sturdevan, Tifton, and Alexander J. Pickelhaupt, Valdosta, both of Ga., assignors to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Nov. 13, 1987, Ser. No. 121,045
Int. Cl.[4] H01R *11/11, 13/516*
U.S. Cl. 439—125 **11 Claims**



1. An angled boot for an angled spark plug cable terminal, comprising:

an angled boot made from an elastomeric material having a first portion with a first end and a second portion with a second end, said portions being disposed at an angle relative to each other, said angle being greater than 90° and less than 180°, each of said first and second portions having a central bore for receiving said angled spark plug cable terminal, said angled boot having at said first end a first aperture contiguous with said central bore for receiving a spark plug and at said second end a second aperture contiguous with said central bore for receiving a spark plug cable which is mechanically and electrically connected to said spark plug cable terminal;

a first external protuberance provided on said second portion of said angled boot, said first external protuberance having a pressing surface which is in a plane substantially perpendicular to the axis of said central bore of said first portion of said angled boot for pressing said terminal onto a spark plug; and

retaining means for fixedly retaining said angled boot and said spark plug cable terminal relative to each other.

4,797,116

ELECTRICAL CONNECTOR HAVING A MOVABLE CONTACT GUIDE AND LANCE-MAINTAINING MEMBER

Shigeru Isohata, Machida, and Masao Tsukakoshi, Kawasaki, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

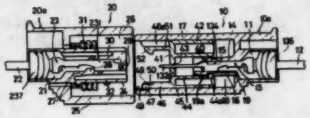
Continuation-in-part of Ser. No. 145,428, Jan. 19, 1988. This application Apr. 26, 1988, Ser. No. 186,339
Claims priority, application Japan, Jan. 26, 1987, 62-009823; May 14, 1987, 62-117918
Int. Cl.[4] H01R *13/424*
U.S. Cl. 439—141 **7 Claims**

1. An electrical connector for electrical engagement with a complementary electrical connector, comprising:

a dielectric housing having passageway means extending therethrough in which electrical contact means disposed;

housing lance means engaging the contact means maintaining said contact means in said passageway means;

movable contact guide means disposed in said housing and having guide plate means provided with hole means through which a front end of contact section means of said contact means extend in order to align and guide the contact section means for electrical engagement with complementary contact section means in the complementary electrical connector when the electrical connector electrically connects with the complementary electrical connector as the movable contact guide means moves



along said housing from an outer position to an inner position during the connection between the electrical connector and the complementary electrical connector; and

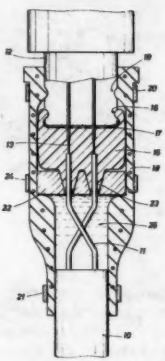
means provided by said movable contact guide means maintaining the housing lance means in engagement with the contact means.

4,797,117

MARINE ELECTRICAL PLUG

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1982, Ser. No. 452,590
Int. Cl.[4] H01R *4/64*
U.S. Cl. 439—200 **7 Claims**



1. A plug, male or female, for an underwater electrical cable comprising:

an electrical contact insert;

at least one conductive pin extending from said electrical contact insert;

at least one insulated conductor extending from said electrical cable and into conductive contact with said conductive pin;

a first non-conductive material disposed surrounding the locale of said conductive contact of said conductive pin and said insulated conductor;

a seal boot at least partially surrounding the first non-conductive material, the insulated conductor extending through a nipple of the seal boot, the first non-conductive material being surrounded on one side by the electrical contact insert and on the other side by the seal boot;

a preloader abutting the seal boot and having an aperture through which the nipple is wedged, the preloader binding and sealing the nipple to the insulated conductor;

a second non-conductive material disposed surrounding the insulated conductor adjacent the preloader; and

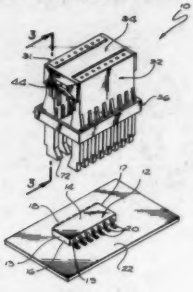
an outer boot at least partially surrounding the non-conductive materials, seal boot and preloader, the seal boot forming a cup and a rim of the cup being secured between a recess in the insert and the outer boot.

4,797,118

TEST ADAPTER FOR INTEGRATED CIRCUIT CARRIER

Kim L. Fennster, Ontario, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 23, 1987, Ser. No. 112,654
Int. Cl.[4] H01R 23/72
U.S. Cl. 439—264 4 Claims



1. An adapter for coupling to a circuit carrier including a carrier housing with opposite sides and a plurality of leads spaced in a row along said sides, comprising:

a one-piece integral frame embodying two spaced slots parallel to each other:

said slots defining a relatively rigid support therebetween:

said frame having two opposite sides;

said slots being parallel to said sides and defining relatively resilient sidewalls adjacent to said sides:

a pair of contact housings each having a set of contacts mounted on one side thereof;

said housings being mounted vertically in said slots with the sides mounting said contacts facing each other;

said sidewalls deforming outwardly when said housings are mounted into said slots;

said housings being pivotable about the sides of said rigid support; and

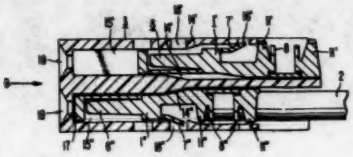
cam means mounted on said housings movable between first and second positions, in said first position said cam means locating the lower ends of said housings so that said contacts can be disposed over said leads with little or no resistance, and shifting of said cam means from said first position to said second position pivots said housings to cause said lower ends thereof to be urged toward each other to press said contacts firmly against said leads.

4,797,119

INSULATION DISPLACEMENT CONNECTION (IDC) TYPE CABLE CONNECTOR AND A METHOD FOR ASSEMBLING A CABLE THERETO

Hideo Miyazawa; Ikuhiro Andoh, both of Yokohama; Hiromichi Koyama, Suzaka, and Mitsuru Kobayashi, Nagano, all of Japan, assignors to Fujitsu Limited, Kawasak, Japan

Continuation of Ser. No. 011,601, Feb. 6, 1987, Pat. No. 4,714,306. This application Dec. 21, 1987, Ser. No. 135,708
Claims priority, application Japan, Feb. 7, 1986, 61-025005
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Int. Cl.[4] H01R 4/24
U.S. Cl. 439—395 12 Claims



1. A cable connector having a plurality of contact parts for engagement with respective corresponding counter contact parts of an opposite connector, said cable connector comprising:

a plurality of separable, elongated, metallic contact terminals, each of which is provided with,

a contact part at one end of the contact terminal for contacting a corresponding contact part of the opposite connector, said contact part of the cable connector having a cross-sectional configuration presenting a width and a height, and

an elongated connection part provided at the opposite end of said contact terminal and adapted for connection to a cable;

a housing made from an insulator material for receiving and holding said contact terminals, said housing being provided with an outer wall, a floor wall, spaced side walls and at least one internal wall parallel to said side walls, said walls defining a plurality of holes, said holes corresponding respectively to said contact terminals for receiving the latter separately and holding them separated from each other, said outer wall being cut away at one end of the housing so as to expose said floor wall and present an open deck therefrom disposed in front of each hole, adjacent decks being separated by an internal wall; and

pre-loading means for holding each contact terminal at respective first and second positions in the housing, said connection part of the contact terminal being positioned on the open deck in an exposed condition when the terminal is in its first position, and said connection part of said contact terminal being entirely covered by said outer wall of said housing when the terminal is in its second position.

4,797,120

COAXIAL CONNECTOR HAVING FILTERED GROUND ISOLATION MEANS

Kirk D. Ulery, Mount Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1987, Ser. No. 132,390
Int. Cl.[4] H01R 17/04
U.S. Cl. 439—578 20 Claims

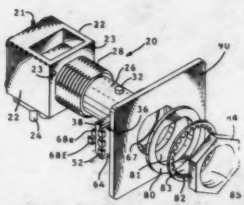
1. An electrical coaxial connector assembly having filtered isolation means for isolating the connector from ground comprising:

a coaxial connector having a conductive inner contact and a conductive outer shell, said shell having first and second portions, said second portion extending outwardly from

said first portion, said second portion including means for being mounted to a conductive panel member;

isolation means having first and second dielectric members cooperating with each other to provide a dielectric passageway through a cutout of a panel member to which the coaxial connector is to be mounted, each said dielectric member having an aperture extending therethrough for receiving said second portion of said conductive shell, said first and second dielectric members including bushing sections extending from surfaces proximate said panel member to engage and thereby form said passageway through said panel member cutout, said first and second dielectric members further including peripheral flanges to extend along major surfaces of said panel member about the periphery of said cutout;

said first dielectric member further including at least one laterally extending flange section providing a respective



substrate to which at least one electrical component is mountable,

conductive circuit means secured to a surface of said peripheral flange and said at least one lateral flange section, said flange surface being remote from said panel member, said circuit means including a portion substantially surrounding said aperture and adapted to engage said conductive shell of said coaxial connector and establish an electrical connection therewith; and

at least one electrical component mounted to said first dielectric member including at least a first contact means connected to said conductive circuit means and including a second contact means adapted to be electrically connected with said conductive panel member whereby said at least one electrical component completes an electrical circuit and provides filtering means between said conductive shell and said conductive panel member.

4,797,121

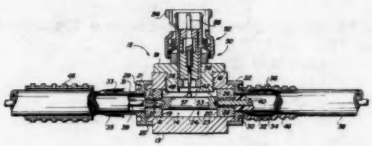
COAXIAL CABLE FITTING

Robert D. Hayward, Phoenix, Ariz., assignor to Gilbert Engineering Company, Inc., Phoenix, Ariz.

Filed Mar. 9, 1988, Ser. No. 168,890

Int. Cl.[4] H01R *17/04*

U.S. Cl. 439—579 **4 Claims**



1. A fitting for tapping into a coaxial cable network comprising:

(A) a block fabricated from a conductive material, said block including:

1. a cylindrical channel extending between coaxially aligned first and second openings; and
2. a passage extending between a third opening and said channel, said passage having an axis disposed at right angles with respect to the axis of said first and second openings;

(B) first and second cylindrical insulators having outside diameters dimensioned to be closely received within said cylindrical chamber, each of said first and second insulators extending between an inside face and an outside face;

1. said first cylindrical insulator being positioned within said cylindrical chamber with its said outside face disposed proximate said first opening;
2. said second cylindrical insulator being positioned within said cylindrical chamber with its said outside face disposed proximate said second opening;
3. a first central aperture extending coaxially through said first insulator; and
4. a second central aperture extending coaxially through said second insulator;

(C) a double-ended pin unit fabricated from a conductive material, said pin unit:

1. having a central region and first and second end regions, said central region extending between said first and second end regions;
2. said first and second end regions extending, respectively, into said first central aperture and into said second central aperture such that said pin unit is supported coaxially within said chamber;
3. a first coaxial center-conductor-receiving blind hole in said first end region; and
4. a second coaxial center-conductor-receiving blind hole in said second end region;

(D) a removable coaxial cable connector assembly comprising:

1. a nipple adapted to be closely removably received within said passage; and
2. an outwardly directed conventional coaxial cable connector extending through and supported by said nipple, said connector including:
   a. outer conductor coupling means; and
   b. inner conductor coupling means; and
3. an inwardly directed and inwardly spring biased center pin, said center pin:
   1. being electrically connected to said inner conductor coupling means; and
   2. bearing at one end on said central region of said pin unit;

(E) first coaxial cable coupling means adapted to permanently secure a first bus coaxial cable end to said block such that a center conductor of said first bus coaxial cable end extends into said first center-conductor-receiving blind hole and an outer conductor of said first bus coaxial cable end is in electrical contact with said block; and

(F) second coaxial cable coupling means adapted to permanently secure a second bus coaxial cable end to said block such that a center conductor of said second bus coaxial cable end extends into said second center-conductor-receiving blind hole and an outer conductor of said second bus coaxial cable end is in electrical contact with said block.

4,797,122

DRIP-PROOF CONNECTOR

Sadao Kuboi, and Tomonari Ohtsuki, both of Mooka, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,308

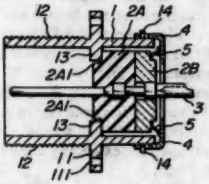
Claims priority, application Japan, Apr. 8, 1987, 62-86189; Dec. 10, 1987, 62-188039[U]

Int. Cl.[4] H01R *13/40*

U.S. Cl. 439—589 **6 Claims**

1. A drip-proof connector including at least one contact, an insert having said contact inserted therein, and a shell enclosing said insert, wherein said insert consists of a front insert having a rubber-like elasticity and a rear insert having no

rubber-like elasticity, diameters of said front and rear inserts being not more than an inner diameter of the shell, said shell being provided in its inside with an inwardly extending flange



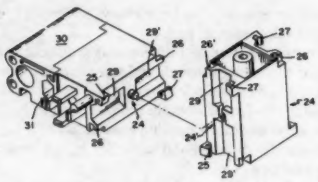
whose inner diameter is smaller than the diameter of said front insert, and a pressing cover is provided on said shell on a side of a contact tail of said contact.

4,797,123

PROGRAMMABLE MODULAR CONNECTOR ASSEMBLY

Ronald M. Weber, Cleona, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 855,225, Apr. 22, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 178,786
Int. Cl.[4] H01R 9/00
U.S. Cl. 439—717 **10 Claims**



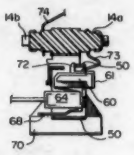
1. A modular connector assembly for the distribution of power to a printed circuit board comprising first and second pairs of matable individual connector modules having different power carrying characteristics, a first connector module of each pair having a pluggable mating face located transversely of a board-engaging face and the second connector module of each pair having a complementary pluggable mating face located opposite a board-engaging face, the board-engaging faces having the same common dimensions, the first individual modules of respective pairs being provided with other, first, pairs of mutually opposite faces extending perpendicularly of the mating and board-engaging faces and having first means to link and interlock them with respective ones of other mutually opposite faces of adjacent modules to form a composite connector body when mounted in a row along one edge of a daughter board such that the mating faces extend perpendicularly to the plane of the printed circuit board, and the second individual modules of respective pairs being provided with other, second, pairs of mutually opposite faces extending perpendicularly of the mating and board-engaging faces and having second means to link and interlock them with respective ones of such other mutually opposite faces of the adjacent modules to form a composite connector body when mounted in a row along the face of a mother board with matable modules of respective pairs in corresponding positions and their mating faces extending parallel to the plane of the mother board, said first and second linking and interlocking means between respective adjacent first and second modules comprising a plurality of interengageable latch members located around and equidistant from a central rotational axis on each of the other mutually opposite faces, the latch members on one of such other mutually opposite faces being oriented in an opposite tangential direction from the latch members on the opposite of the other faces whereby the modules can be linked and interlocked together by relative rotation of their respective other mutually opposite faces about such axes to bring the latch members into engagement.

4,797,124

CONNECTOR BODIES AND ASSEMBLIES

Laurence A. J. Beaulieu, Kanata, and Alex G. Cristescu, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 856,518, Apr. 28, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 18,230
Int. Cl.[4] H01R 9/24
U.S. Cl. 439—719 **4 Claims**



1. A connector comprising an elongate dielectric body provided by first and second body portions in which:

the first body portion is planar and elongate and has two elongate sides and two opposite edges extending between the sides, the first body portion carrying a first row and a second row of insulation displacement terminals positioned one row along each side of the first body portion with the terminals of one row electrically interconnected with the terminals of the other row through the first body portion; and

the second body portion projects outwardly from one of the elongate sides of the first body portion and extends along the length of the first body portion, the second body portion have two oppositely facing elongate sides which face laterally of the length of the first and second body portions, one of said elongate sides having a first series of openings spaced apart along said one side to receive plug retainers for modular jacks and other side having a second series of openings spaced apart along said other side for receiving plugs for the modular jacks, the first series of openings facing laterally of the body in the same direction as the first row of terminals and each opening of the first series interconnecting through the second body portion with a corresponding opening of the second series.

4,797,125

ELECTRODE CONNECTOR FOR SUBSTRATE ELECTRODES

Anthony Malana, San Dimas, Calif., assignor to Tronomed, Inc., Laguna Hills, Calif.

Filed May 27, 1987, Ser. No. 55,163
Int. Cl.[4] H01R 4/48
U.S. Cl. 439—729 **19 Claims**

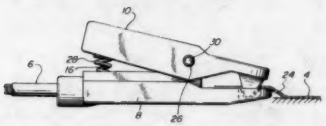
1. A medical electrical connector for flexible resting electrodes applied to a patient, comprising:

a first base member having a flat support surface with a receptacle extending into the flat support surface;

a second member attached to the first member and relatively movable with the first member, the second member having a prong member of a configuration compatible with movement into the receptacle; and

means, on one of the receptacle and prong member, for providing electrical contact with the electrode when the prong member is positioned on one side of the electrode

and the receptacle is positioned on the other side, the prong member forcing the electrode to be deformed and



to be positioned within the receptacle for providing a positive locking contact.

4,797,126

ADJUSTABLE LENGTH SLOTLESS FEMALE CONTACT FOR CONNECTORS

Julius Botka, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 877,951, Jun. 24, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 212,038

Int. Cl.[4] H01R *13/11*

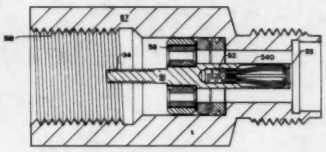
U.S. Cl. 439—843 **4 Claims**

1. A slotless female connector comprising:

a cylindrical outer shell having a side wall encircling a cavity and forming an opening extending from the cavity through a first end of the shell;

that slopes an acute angle B relative to an axis A of the cylindrical outer shell;

a collette inserted within the cavity, said collette having a plurality of tines, each of which has a first end that is in contact at an associated point P with the sloping inner



surface of the shell, each of points P being substantially flush with the first end of the shell;

wherein, for each tine, the distance from axis A to the tine is the smallest at an associated point Q located at substantially the same distance along axis A as point P, whereby, when a center pin of a male connector is inserted into the female connector, contact with each tine is made at point Q adjacent to point P.

4,797,127

LOW FOAMING, HIGH WEAVING EFFICIENCY POLYVINYL ALCOHOL SIZE COMPOSITION

Finn L. Marten, Macungie, and Amir Famili, Schnecksville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 785,940, Oct. 9, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 171,206
Int. Cl.[4] C08L 5/00
U.S. Cl. 8—115.6 14 Claims

1. A sizing composition consisting essentially of

(a) 100 parts by weight 85–97 mole % hydrolyzed polyvinyl alcohol,

(b) 2–15 parts by weight hydrogenated tallow wax or a fatty acid,

(c) 1–3 parts by weight surfactant composition consisting essentially of an ethylene oxide-propylene oxide surfactant having a surface tension ranging from 37 to 48 dynes/cm measured at 25° C. in a 0.1% aqueous solution and a foaming number less than 10 as determined in a 7% aqueous polyvinyl alcohol solution containing 11.4 parts by weight hydrogenated tallow wax and two parts by weight surfactant per 100 parts by weight 87–89 mole % hydrolyzed polyvinyl alcohol having a DP of about 1700.

4,797,128

METHOD OF AND APPARATUS FOR CLEANING GARMENTS AND SOFT GOODS CONTAMINATED WITH NUCLEAR, CHEMICAL AND/OR BIOLOGICAL CONTAMINANTS

David E. Fowler, Gainesville, Fla., assignor to Quadrex HPS, Inc., Gainesville, Fla.

Filed Dec. 10, 1984, Ser. No. 679,641
Int. Cl.[4] B08B 3/00
U.S. Cl. 8—137 15 Claims

1. A method of decontaminating garments, soft good or mixtures thereof contaminated with radioactive particulates, toxin, chemical, and biological contaminants comprising the steps of:

(a) depositing contaminated garments, soft goods or mixtures thereof in a cleaning drum;

(b) charging the drum with a cleaning solvent in which the chemical contaminants are soluble;

(c) agitating the drum during a wash cycle to separate radioactive, toxin, biological particulate matter or mixtures thereof from the garments;

(d) draining the drum of the dry cleaning solvent which contains suspended particulate contaminants and dissolved chemical contaminants;

(e) contacting the drained solvent with both a neutralizing agent and an oxidizing agent, said neutralizing agent being selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof and having a concentration greater than one (1.0) normal, said oxidizing agent being selected from the group consisting of calcium hypochlorite, sodium hypochlorite and mixtures thereof and having a concentration of greater than ten percent (10%), so as to activate the toxin, the biological contaminants or mixtures thereof suspended in the solvent and further so as to oxidize the chemical contaminants dissolved in the solvent and thereby placing the toxin, biological contaminants chemical contaminants or mixtures thereof in nontoxic form;

(f) rinsing the garments, soft goods or mixtures thereof by circulating clean solvent from a solvent tank through the drum thereby effecting additional removal and flushing of particulate and chemical contaminants;

(g) filtering the circulated solvent to remove the particulate material suspended in the solvent prior to addition to the drum; and

(h) preferentially adsorbing the chemical contaminants dissolved in the circulated solvent prior to addition to the drum.

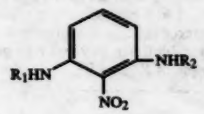
4,797,129

DYE COMPOSITIONS FOR KERATINOUS FIBRES CONTAINING 2-NITRO-METAPHENYLENEDIAMINES

Alex Junino, Livry-Gargan; Gerard Lang, Saint-Gratien; Nicole Jehanno, Brunoy, and Jean J. Vandenbossche, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Filed Feb. 17, 1987, Ser. No. 15,032
Claims priority, application Luxembourg, Feb. 14, 1986, 86308
Int. Cl.[4] A61K 7/13; C07C 87/58, 87/60
U.S. Cl. 8—407 22 Claims

1. A dye composition for keratinous fibers comprising a solvent, a tinctorially effective amount of at least one dye compound having the formula



(I)

wherein

R_1 and R_2, each independently, represent hydrogen, alkyl containing 1–6 carbon atoms, monohydroxyalkyl containing 1–6 carbon atoms, polyhydroxyalkyl containing 1–6 carbon atoms, alkoxyalkyl wherein the alkyl moiety contains 1–6 carbon atoms, hydroxyalkoxyalkyl wherein the alkyl moiety contains 1–6 carbon atoms, or aminoalkyl wherein the alkyl moiety contains 1–6 carbon atoms and wherein the amino moiety is unsubstituted or substituted with 1–2 alkyl or hydroxyalkyl groups wherein said alkyl has 1–6 carbon atoms or wherein the nitrogen atom of said amino alkyl forms part of a heterocycle, or a cosmetically acceptable salt of the dye compound of formula I containing an amino group which can be salified and at least one of an anionic, cationic, nonionic or amphoteric surface active agent or a mixture thereof, a thickener, a dispersing agent, a penetrating agent, a sequestrant, a film-forming agent, a buffer, a perfume or an acidifying agent.

4,797,130

OXIDATIVE HAIR DYE COMPOSITION BASED ON 4-AMINO-2-AMINOMETHYL-PHENOLS

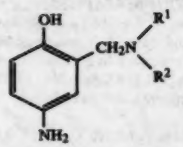
Thomas Clausen, Alsbach, and Eugen Konrad, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00674, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03474, PCT Pub. Date Jun. 18, 1987
PCT Filed Nov. 22, 1986, Ser. No. 93,744
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1985, 3543345
Int. Cl.[4] A61K 7/13; C07C 10/344, 91/44; C07D 263/22
U.S. Cl. 8—421 12 Claims

1. A hair dyeing composition comprising a combination of

(A) at least one organic coupler substance customary in hair coloring with the coupler containing a moiety from the group consisting of hydroxy, ether, amino and mixtures thereof; and

(B) a developer substance selected from the group consisting of 4-amino-2-amino-2-aminomethyl-phenol of the formula (I)



(I)

and its physiologically compatible salts with inorganic or organic acids, wherein R^1 and R^2 independently of one another represent hydrogen, alkyl, hydroxyalkyl, aminoalkyl, mono- or dialkylaminoalkyl, acylaminoalkyl, aryl- or alkylsulfonylaminoalkyl, carbamidoalkyl, alkylsulfonyl, the alkyl radical in each case having 1 to 4 carbon atoms, arylsulfonyl, acyl or carbamoyl, or a heterocyclic, non-aromatic five-membered or six-membered ring, which can have an oxo group in addition, is formed by means of R^1 and R^2.

4,797,131

USE OF CERTAIN QUATERNARY AMMONIUM COMPOUNDS IN DYEING LEATHER WITH BASIC DYESTUFFS

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 781,342, Sep. 30, 1985, abandoned. This application Feb. 19, 1987, Ser. No. 16,302

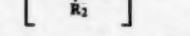
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436572

Int. Cl.[4] D06P *3/32*

U.S. Cl. 8—436 **30 Claims**

1. A method for dyeing a substrate selected from the group consisting of leather, hides, skins and furskins which comprises the steps of

A. applying to the substrate a compound or mixture of compounds of formula I



(I)

in which R_1 is a C_{8-18}aliphatic residue;

each R_2, independently, is C_{1-4}alkyl;

R_3 is a C_{1-18}aliphatic residue or $—CH_2R_4$ where R_4 is phenyl; phenyl substituted by up to two substituents selected from the group consisting of chlorine, bromine, methyl, methoxy and ethoxy; or naphthyl; and

X is a non-chromophoric anion, and

B. dyeing the substrate with a basic dyestuff selected from the group consisting of polycationic dyestuffs having at least 1.3 cationic groups per dyestuff molecule and cationic zeo dyestuffs containing at least one component residue derived from a further substituted 6-hydroxy-2-pyridone,

said step A being carried out before or during said step B and the amount of compound of formula I being effective to improve the levelness of the dyeing with the basic dyestuff.

4,797,132

GAS CONTROL APPARATUS

Edward E. VanVlack, 1627 Maple, Myrtle Point, Oreg. 97458

Filed Jul. 7, 1987, Ser. No. 70,584

Int. Cl.[4] B01D *53/14*

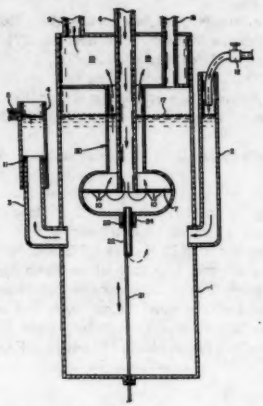
U.S. Cl. 55—227 **3 Claims**

1. A gas control apparatus comprising:

a. a tank with liquid into which a fluid inlet and a fluid outlet communicates;

b. at least one gas flow unit within said tank immersed in said liquid where a gas inlet communicates to said gas flow unit and a gas outlet communicates from said gas flow unit and where a baffle with holes connects the base of said gas inlet to said gas flow unit;

c. a fixed safety pipe fixeably attached to the base of said gas



flow unit where an adjustable safety depth outlet is contained within said fixed safety pipe; and

d. a safety outlet communicating said tank to the atmosphere.

4,797,133

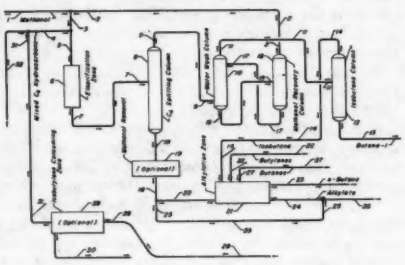
PROCESS FOR RECOVERY OF BUTENE-1 FROM MIXED C4 HYDROCARBONS

Peter R. Pujado, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1986, Ser. No. 946,999

Int. Cl.[4] C10L *1/02*

U.S. Cl. 44—53 **24 Claims**



1. A process for the production of butene-1, which process comprises the steps of:

(a) contacting a mixed C_4 feedstream comprising isobutylene, isobutane, normal butane, butane-2 and butene-1 and an alcohol with an etherification catalyst maintained at etherification promoting conditions in a reaction zone, and producing a reaction zone effluent stream comprising normal butane, butane-2, butene-1, isobutane and a C_4-plus ether;

(b) separating the reaction zone effluent stream in a first fractionation zone into a net overhead stream comprising butene-1 and isobutane and a net bottoms stream comprising normal butane, butene-2 and the ether, with the net bottoms stream having a hydrocarbon concentration above 10 mole percent;

(c) recovering the net bottoms stream as a first product stream; and,

(d) separating the net overhead stream in a second fractionation zone into a second product stream rich in isobutane and a third product stream rich in butene-1.

4,797,134

ADDITIVE COMPOSITION, FOR GASOLINE

Marcel Vataru, Los Angeles, Calif., assignor to Wynn Oil Company, Fullerton, Calif.

Filed Aug. 27, 1987, Ser. No. 89,598

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] C10M *1/14, 1/22, 1/18*

U.S. Cl. 44—66 13 Claims

5. An admixture that comprises Diesel fuel and an additive composition added thereto which is between about 0.05 to about 2.0 percent by weight of the fuel, said composition comprising:

(a) between about 0.05 and 25% relative weight parts of an organic peroxide, and

(b) between about 0.1 and 25% relative weight parts of detergent selected from the component group that consists of:

(i) fatty amines

(ii) ethoxylated and propoxylated derivatives of fatty amines

(iii) fatty diamines

(iv) fatty imidazlines

(v) polymeric amines and derivatives thereof,

(vi) combination of one or more of said (i) through (v) components with carboxylic acid or acids having from three to forth carbon atoms,

(c) from about 99.0 to about 50% by weight of a hydrocarabon solvent.

4,797,135

METHOD OF FACILITATING COMMINUTION OF WOOD AND OTHER TYPES OF VEGETABLE BIOMASS FOR USE AS FUEL

Josef Kubat, Solparksvägen 3, S-171 35 Solna, and Lars M. Qvist, Hästhagsvägen 6, S-448 00 Floda, both of Sweden

PCT No. PCT/SE87/00071, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO87/05044, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 13, 1987, Ser. No. 132,952

Claims priority, application Sweden, Feb. 14, 1986, 8600669-9

Int. Cl.[4] C10L *5/44, 5/40*

U.S. Cl. 44—500 6 Claims

1. A method for the production of highly comminuted flour of wood and other types of vegetable biomass suitable for use as fuel characterized in that coarsely ground wood or other type of coarsely ground vegetable biomass is treated with a dilute aqueous solution of an alkaline substance and subsequently is dried by exposure to elevated temperatures, whereafter the treated coarsely ground material is subjected to grinding, whereby a finely divided powder with a narrow particle size distribution is obtained.

4,797,136

LOW RANK COAL BY WET OXIDIZING, DRYING AND COOLING

Mark A. Siddoway, Houston; Neal D. Stidham, Gillette, Wyo., and William C. Machmer, Sugarland, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 943,455, Dec. 19, 1986, abandoned. This application Mar. 15, 1988, Ser. No. 175,653

Int. Cl.[4] C10L *5/24;* F26B *7/00*

U.S. Cl. 44—501 11 Claims

1. In a process in which low rank coal is oxidized, dried and cooled for reducing its tendency toward spontaneous combustion, an improvement comprising:

contacting particulate coal with an aqueous oxidant solution which becomes substantially homogeneously distributed over the surfaces of the coal particles, without adding more than about 10% by weight of water to the coal;

said solution containing an oxidizing agent containing combined oxygen;

drying the oxidant solution wetted coal by heating the coal particles to a temperature between about 100° F. and about 400° F. to reduce the moisture content to substantially the moisture content desired for the coal product; and

cooling the so-treated coal to a temperature of less than about 100° F.

4,797,137

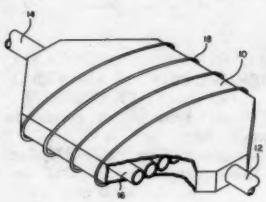
APPARATUS FOR CLEANING FOSSIL FUEL, SUCH AS COAL AND CRUDE OIL

Robert C. Sutton, Peoria, Ill., assignor to Sutton Energy Corporation, Washington, Ill.

Division of Ser. No. 31,744, Mar. 30, 1987. This application Jul. 6, 1987, Ser. No. 69,853

Int. Cl.[4] B01J *16/00*

U.S. Cl. 44—639 4 Claims



1. An apparatus for the desulfurization of fossil fuels including crude oil and/or coal, the apparatus comprising:

(a) a receptacle for containing the fossil fuel in a liquid medium, the receptacle having at least one opening for the inlet and one opening for the outlet of the fossil fuel;

(b) a plurality of copper tubes which are aligned generally parallel to the flow path between the openings for the inlet and outlet to permit the liquid medium to flow both interiorly and exteriorly of the copper tubes within the receptacle;

(c) an electrical induction coil electromagnetically coupled to said receptacle for stirring the fossil fuel in the receptacle, and

(d) a lower portion of the receptacle being formed as a sump for the collection of waste particles.

4,797,138

POLYCRYSTALLINE DIAMOND AND CBN CUTTING TOOLS

Ranga Komanduri, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

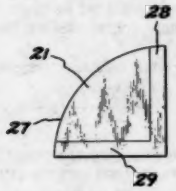
Division of Ser. No. 830,414, Feb. 18, 1986, Pat. No. 4,690,691. This application May 11, 1987, Ser. No. 48,176

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 4 Claims

1. A cutting tool consisting essentially of a polycrystalline diamond or cubic boron nitride layer directly adhered to an integral substrate structure, said substrate structure consisting essentially of a substrate having only one substantially straight edge from which a wall extends integrally, said substrate having a flat support surface which forms a support area with said wall, said support area being substantially in the form of a half circle, said substrate being substantially in the form of a half circle, said support area being substantially filled with said diamond or cubic boron nitride layer, said diamond or cubic

boron nitride layer being substantially in the form of a half circle having a round cutting edge and one substantially straight adhered edge, a face of said diamond or cubic boron nitride layer being adhered to said flat support surface and the adhered edge of said diamond or cubic boron nitride layer



being adhered to a side of said wall, the thickness of said polycrystalline layer and the height of said wall being substantially equivalent, said substrate structure consisting essentially of polycrystalline metal carbide containing a metallic cementing agent.

4,797,139

BOEHMITE PRODUCED BY A SEEDED HYDYOTHERMAL PROCESS AND CERAMIC BODIES PRODUCED THEREFROM

Ralph Bauer, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 84,549, Aug. 11, 1987, abandoned. This application Dec. 16, 1987, Ser. No. 133,584

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **27 Claims**

1. A method of making a microcrystalline boehmite product comprising heating under autogenous pressure a boehmite alumina precursor in an aqueous medium having a pH selected from a value of 5 or less and 8 or higher and in the presence of boehmite seed particles finer than 0.02 microns, said seed particles being present in an amount greater than 7.5% by weight of the precursor alumina, calculated as Al_2O_3, said heating being carried out above 130° C. for a time sufficient to substantially convert said precursor to microcrystalline boehmite.

4,797,140

SCRUBBING OF GAS TO RECOVER LIGHT HYDROCARBONS

Heiner Landeck, Munich, and Gerhard Ranke, Poecking, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 871,988, Jun. 9, 1986. This application Aug. 14, 1986, Ser. No. 896,371

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529216; Oct. 7, 1985, 3535764

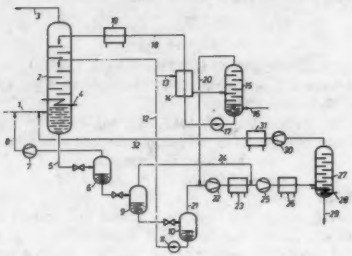
Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—48 **27 Claims**

1. In a process for the recovery of:

(a) C_{2+} hydrocarbons together with sulfur compounds, or

(b) C_{3+} hydrocarbons together with sulfur compounds, from a gaseous mixture containing the hydrocarbons, CO_2, at least one of H_2S, COS or a mercaptan and at least one of CH_4 or an inert gas from the group comprising H_2, N_2 and CO, said process comprising scrubbing said gaseous mixture with a physical scrubbing medium to selectively remove (a) or (b) by absorption and regenerating resultant loaded scrubbing medium to produce a product stream containing (a) or (b) and regenerated scrubbing medium, the improvement wherein the scrubbing medium comprises a compound having one to two rings formed by 5 to 6 carbon atoms, respectively, wherein the compound comprises in total at least 9 and at the most 17 carbon



atoms, and the rings are saturated, unsaturated or partially saturated.

4,797,141

METHOD FOR OBTAINING CO_2 AND N_2 FROM INTERNAL COMBUSTION ENGINE OR TURBINE GENERATED GASES

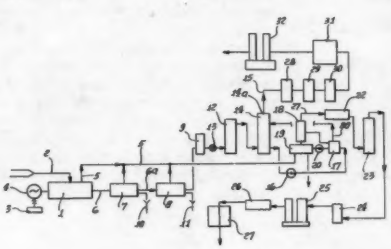
Juan P. Mercader, and Pablo R. Villamanan, both of Barcelona, Spain, assignors to Carburos Metalicos S.A., Barcelona, Spain

Filed Aug. 24, 1987, Ser. No. 88,805

Claims priority, application Spain, Apr. 21, 1987, 8701147

Int. Cl.[4] F25J *3/00*

U.S. Cl. 62—17 **21 Claims**



1. In the method of obtaining CO_2 and N_2 from hot combustion exhaust gas, the steps that include:

(a) recovering heat from the hot exhaust gas, thereby to cool the gas,

(b) stripping CO_2 from the cooled gas and compressing and liquifying the CO_2,

(c) thereafter purifying the remaining cooled gas to remove contaminates, thereby to recover pure N_2, and compressing and liquifying said N_2,

(d) the energy required for said (b) and (c) steps being derived from said (a) step heat recovery.

4,797,142

METHOD OF PREPARING A MELT FOR THE PRODUCTION OF MINERAL WOOL

Leif M. Jensen, Roskilde, Denmark, assignor to Rockwool International A/S, Hedehusene, Denmark

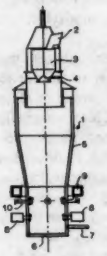
PCT No. PCT/DK87/00056, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06926, PCT Pub. Date Nov. 19, 1987

PCT Filed May 14, 1987, Ser. No. 143,132

Claims priority, application Denmark, May 14, 1986, 2226/86

Int. Cl.[4] C03B *37/01, 37/06, 5/12;* F27B *1/09*

U.S. Cl. 65—2 5 Claims



1. A method of preparing a melt for the production of mineral wool, wherein a raw material having a composition suitable for the production of the melt and a carbonaceous material are fed into a preheating zone in the upper portion of a shaft furnace and oxygen-containing gas is introduced into an oxidation zone in the lower portion of the shaft furnace to effect a combustion of the carbonaceous material and to heat the raw material, and wherein a melt is discharged from the bottom of the shaft furnace, characterized in that combustion in the oxidation zone is controlled in such a manner that the temperature in the transition between the oxidation zone and the preheating zone does not exceed about 1000° C., and that the material in the zone below the oxidation zone is heated solely by plasma heating.

4,797,143

PROCESS FOR THE PRODUCTION OF OPTICAL FIBER PREFORMS

Kazunori Chida, Ibaraki; Hiroshi Yokota, Kanagawa; Michihisa Kyoto, Kanagawa; Hisao Sato, Kanagawa; Minoru Watanabe, Kanagawa, and Naoki Yoshioka, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

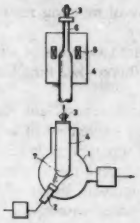
Continuation of Ser. No. 473,420, Mar. 9, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 781,182

Claims priority, application Japan, Mar. 12, 1982, 57-38094

Int. Cl.[4] C03B *37/018*

U.S. Cl. 65—3.12 16 Claims

1. A process for producing an optical fiber porous preform having a predetermined refractive index distribution by a vapor-phase axial deposition method in which a glass material and a refractive index changing dopant material are subjected to flame oxidation by use of an oxyhydrogen burner to form fine glass particles deposited on one end of a supporting rod adapted to move apart from the oxyhydrogen burner while rotating to allow a rod-like porous preform to grow thereon, the improvement which comprises; determining a relationship between shape of the deposition face of the preform and refractive index and, controlling the shape of the deposition face of said preform during growth thereof to provide a predetermined refractive index to the preform based on said relationship.



4,797,144

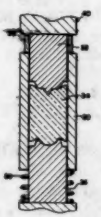
DEEP PRESSING MOLD AND PROCESS FOR MOLDED OPTICAL ELEMENTS

Jeffery A. DeMeritt, Painted Post; Thomas E. Patykula, Elmira, and Paul A. Sachenik, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,518

Int. Cl.[4] C03B *23/00*

U.S. Cl. 65—102 12 Claims



1. An apparatus for molding an optical element having first and second opposed optical surfaces comprising

a first mold having a molding surface adapted to form said first optical surface,

a second mold having an opposed molding surface adapted to form said second optical surface,

an alignment sleeve defining a cavity extending therethrough to accommodate said first and second molds, said molding surfaces being cooperable within said cavity to form an enclosed mold cavity of fixed volume,

means for independently controlling the movement of said first mold relative to said second mold,

means in operable relationship with said alignment sleeve for stopping the movement of said first mold relative to said alignment sleeve when the distance traveled during such movement equals a distance corresponding to the total relative movement between said first and second molds necessary to form the optical surfaces at substantially the same time multiplied by a predetermined ratio.

9. A method of molding an optical element having first and second opposed optical surfaces comprising the steps of

providing a first mold having a molding surface adapted to form said first optical surface,

providing a second mold having an opposing molding surface adapted to form said second optical surface,

providing an alignment sleeve defining a cavity extending therethrough to accommodate said first and second molds,

providing means operatively associated with said alignment sleeve for floating said sleeve,

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disposing said first and second molds within said alignment sleeve cavity and in a slidable engagement therewith such that said molding surfaces are in a cooperable relationship defining an enclosed mold cavity,

disposing a quantity of molding material within said mold cavity,

moving said first mold within said sleeve cavity along the longitudinal axis thereof in a direction toward said second mold,

controlling the movement of said first mold so that it is independent of the movement of said second mold,

providing means in operable relationship with said alignment sleeve for stopping the movement of said first mold relative to said alignment sleeve after said first mold traversed a predetermined distance,

stopping the movement of said first mold relative to said alignmenet sleeve by said means for stopping,

moving said second mold within said sleeve cavity along the longitudinal axis thereof in a direction toward said first mold, and

stopping the movement of said second mold relative to said alignment sleeve defining a fixed mold cavity volume between said mold surfaces thereby forming an optical element having opposed optical surfaces.

4,797,145

METHOD OF AGRICULTURAL SOIL IMPROVEMENT

Garn A. Wallace, 1647 Manning Ave., Los Angeles, Calif. 90024, and Arthur Wallace, 10215 Clematis Ct., Los Angeles, Calif. 90077

Filed Feb. 18, 1986, Ser. No. 830,078
Int. Cl.[4] C05G *3/04*
U.S. Cl. 71—27 **4 Claims**

1. The method of improving the tilth, structure, aeration, friability and water infiltration of soils subject to slaking, erosion, compaction, or crusting, said method comprising mixing a synthetic, water soluble polyelectrolyte and a polysaccharide with water, wherein said polyelectrolyte consists essentially of polyacrylamide having an average molecular weight of at least 15,000, with said polyelectrolyte being mixed with the water in an amount of between about 0.0001% and 0.1% by weight, and further wherein said polysaccharide consists essentially of polygalactosylmannose, with said polysaccharide being mixed with the water in an amount of between about 1% and 300% of the amount of polyelectrolyte, and applying the mixed water solution to the soil.

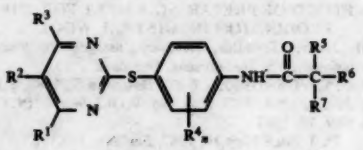
4,797,146

HERBICIDAL 2-[4-SUBSTITUTED CARBOXYAMINO-PHENYL MERCAPTO)]-SUBSITUTED PYRIMIDINES

Klaus Sasse, Bergisch Gladbach; Hermann Hagemann; Hans-Joachim Santel, both of Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,940
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544208
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] C07D *239/02;* A01N *43/48*
U.S. Cl. 71—92 **11 Claims**

1. A pyrimidylmercaptoacylanilide of the formula



in which

R^1 represents methyl or ethyl,

R^2 represents halogen, methyl or ethyl,

R^3 represents hydrogen or methyl,

R^4 represents halogen, methyl or methoxy,

n represents 0, 1 or 2,

R^5 represents hydrogen, halogen, cyano, alkyl having 1 to 6 carbon atoms which is unsubstituted or substituted by fluorine, chlorine, bromine or alkoxy having 1 to 4 carbon atoms, phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, trifluoromethyl, methoxy or methyl, benzyl which is unsubstituted or substituted by fluorine, chlorine, bromine, trifluoromethyl, methoxy or methyl, or the $-OR^8$ or $-SO_m-R^8$ radical, where

R^8 represents alkyl having 1 to 6 carbon atoms unsubstituted or substituted by fluorine, chlorine or bromine, or phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine or alkyl having 1 to 4 carbon atoms and

m represents 0, 1 or 2, and

R^6 and R^7, independently of one another, represent halogen or alkyl having 1 to 6 carbon atoms unsubstituted or substituted by fluorine, chlorine or bromine, or

R^5 and R^6, together with the neighboring carbon atom, represent a carbocyclic ring or a ring which can also contain oxygen in the ring in addition to carbon atoms, which has 3 to 8 ring members, and which is unsubstituted or substituted by fluorine, chlorine or alkyl having 1 to 4 carbon atoms or

R^6 and R^7, together with the neighboring carbon atom, represent a carbocyclic ring or a ring which can contain oxygen in the ring in addition to carbon atoms, which has 3 to 8 ring carbon atoms, and which is unsubstituted or substituted by fluorine, chlorine or alkyl having 1 to 4 carbon atoms.

10. A method of combating unwanted vegetation which comprises applying thereto or to a locus from which is is desired to exclude such vegetation a herbicidally effective amount of pyrimidylmercapto-acylanilide according to claim 1.

4,797,147

HERBICIDAL METHOD AND COMPOSITION UTILIZING CERTAIN 5-(2-SUBSTITUTED BENZOYL)-BARBITURIC ACIDS

David L. Lee, Martinez, Calif., and Charles G. Carter, Silver Spring, Md., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 872,068, Jun. 9, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 91,162
Int. Cl.[4] A01N *43/54*
U.S. Cl. 71—92 **16 Claims**

1. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula

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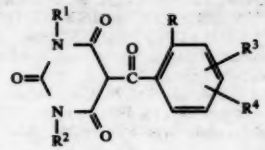


wherein

R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_m— wherein m is 0 or 2 and R^a is C_1–C_2 alkyl;

R^1 is hydrogen or C_1–C_2 alkyl;

R^2 is hydrogen or C_1–C_2 alkyl; and

R^3 and R^4 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined and their salts.

4,797,148

QUINOLINE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Helmut Hagen, Frankenthal; Ulrich Eichenauer, Frankfurt; Peter Plath, Frankenthal; Norbert Meyer, Ladenburg, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

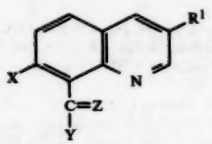
Filed Nov. 24, 1986, Ser. No. 933,795

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541722; Mar. 4, 1986, 3606949

Int. Cl.[4] C07D *215/48;* A01N *43/42*

U.S. Cl. 71—94 **8 Claims**

1. A quinoline derivative of the formula



(I)

where R^1 is halogen or C_1–C_4-alkyl, X is halogen, Z is oxygen Y is a radical —NR^2R^3, in which R^2 is hydrogen and R^3 is C_1–C_4-alkoxy, or Y is a hydrazino radical which is unsubstituted or substituted by C_2–C_5-alkylcarbonyl, C_2–C_5-alkoxycarbonyl or C_1–C_4-alkyl which is unsubstituted or substituted by C_2–C_5-alkoxycarbonyl.

7. A process for combatting the growth of unwanted plants, wherein the unwanted plants and/or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a quinoline derivative of the formula I as set forth in claim 1.

4,797,149

2,6-SUBSTITUTED PYRIDINE COMPOUNDS

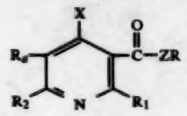
Len F. Lee, St. Charles, and Maria L. Miller, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 768,659, Aug. 27, 1985, Pat. No. 4,698,093, which is a continuation-in-part of Ser. No. 668,929, Nov. 6, 1984, abandoned. This application Jun. 22, 1987, Ser. No. 65,210

Int. Cl.[4] C07C *213/55;* A01N *43/40*

U.S. Cl. 71—94 **22 Claims**

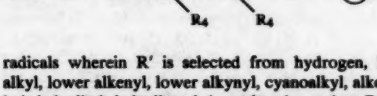
1. A compound represented by the formula



wherein:

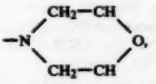
R is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alknyl, cyanoalkyl, alkoxyalkyl, haloalkyl, haloalkenyl, benzyl, and a cation, and Z is selected from O and S;

R_1 and R_2 are independently selected from fluorinated methyl, chlorofluorinated methyl, fluorinated ethyl, and lower alkyl provided that Rl and R_2 cannot both be lower alkyl radicals;



radicals wherein R′ is selected from hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyanoalkyl, alkoxyalkyl, haloalkyl, haloalkenyl, benzyl and a cation; R″ and R‴ are independently selected from lower alkyl, lower alkenyl, lower alkynyl, cyanaoalkyl, alkoxyalkyl, haloalkyl, and haloalkenyl provided that R‴ may also be hydrogen; R_3 and R_4 are in each occurrence independently selected from hydrogen, lower alkyl, aralkyl, lower alkenyl, lower alkynyl, haloalkyl, and haloalkenyl; Y is a halogen selected from F, Cl, and Br; and

is selected from the group consisting of aziridinyl, piperidinyl, azetidinyl, pyrrolidinyl, hexahydroazepinyl, imidazolyl, pyrrolyl, triazolyl, pyrazolyl, morpholino, and



optionally substituted with lower alkyl substituents, and; X is selected from

(j)

in which R_{16} is alkyl.

4,797,150

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-1,3,5-CYCLOHEXANETRIONES

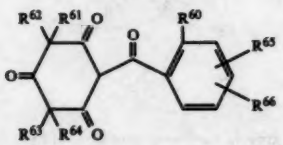
Charles G. Carter, Silver Spring, Md., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 110,988, Oct. 21, 1987, which is a division of Ser. No. 880,370, Jun. 30, 1986, which is a continuation-in-part of Ser. No. 872,067, Jun. 9, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,449

Int. Cl.[4] A01N *41/10*; C07C *147/107*

U.S. Cl. 71—103 35 Claims

1. Compounds of the formula



wherein

R^{60} is hydrogen; halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_n- wherein n is 0 to 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl; or trifluoromethoxy or difluoromethoxy;

R^{61} is hydrogen or C_1–C_4 alkyl;

R^{62} is hydrogen or C_1–C_4 alkyl; or

R^{61} and R^{62} together are R_2–C_5 alkylene;

R^{63} is C_1–C_4 alkyl;

R^{64} is C_1–C_4 alkyl; or

R^{63} and R^{64} together are C_2–C_5 alkylene;

R^{65} and R^{66} independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n- wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) -NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^cC(O)$- wherein R^c is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) -$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) -$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined and their salts.

4,797,151

PROCESS FOR IMPROVING FLORAL FERTILITY

Edmond A. DeMil, 140 rue Saint-Charles, 75015 Paris, France

Filed Sep. 16, 1986, Ser. No. 908,404

Claims priority, application France, Sep. 17, 1985, 85 13738

Int. Cl.[4] A01N *37/02*

U.S. Cl. 71—113 5 Claims

1. Process for increasing the floral fertility of plants consisting of the step of applying to the plants, during the period betewen floral induction and the end of inflorescence of said plants, a floral fertility increasing amount of lipoaminoacids, said lipoaminoacids being defined as the result of acylation by a fatty acid comprising from 4 to 30 carbon atoms of a compound selected from the group consisting of isolated naturally occuring aminoacids, mixtures of naturally occuring aminoacids obtained by hydrolysis of proteins, metal or amine salts of either of the foregoing, and basic aminoacids, thereby increasing the floral fertility of the plant.

4,797,152

CYCLOHEXENONECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

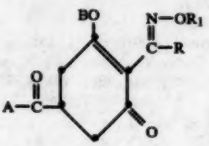
Division of Ser. No. 714,133, Mar. 20, 1986, Pat. No. 4,640,706. This application Nov. 14, 1986, Ser. No. 930,829

Claims priority, application Switzerland, Mar. 30, 1984, 1613/84

Int. Cl.[4] A01N *37/18*; C07C *103/19*

U.S. Cl. 71—118 8 Claims

1. A cyclohexenone carboxylic acid derivative of formula I



(I)

wherein

A is —NR_3R_4

B is —R_6

R is C_1–C_6alkyl or C_3–C_6cycloalkyl, each unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio,

R_1 is C_1–C_6alkyl, C_1–C_6haloalkyl, C_3–C_6alkenyl, C_3–C_6haloalkenyl or C_3–C_6alkynyl,

R_3 is hydrogen, C_1–C_6alkyl, C_1–C_6haloalkyl, C_2–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; or is C_3–C_6alkenyl which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy or C_1–C_4alkylthio; or is C_3–C_6alkynyl; or is phenyl or benzyl, the phenyl nucleus of which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, nitro or cyano,

R_4 is C_1–C_4alkoxy or has the same meaning as R_3, or R_3 and R_4 together with the nitrogen atom to which they are attached are also a saturated 5- or 6-membered heterocycle and

R_6 is C_1–C_6alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl; or is benzyl, the nucleus of which unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, nitro or cyano.

4,797,153

METHOD OF INCREASING BIOMASS IN PLANTS

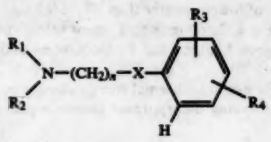
Henry Yokoyama, Pasadena; Wan-Jean Hsu, San Marino; Stephen M. Poling, Arleta, and Ernest P. Hayman, Pasadena, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 435,597, Oct. 21, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,660

Int. Cl.[4] A71N *33/04*

U.S. Cl. 71—121 15 Claims

1. A method for increasing total plant biomass which comprises applying to a plant immediately prior to or at a time when cell differentiation and growth of the plant or flower buds are great, that is, to the plant seed, to the plant seedling prior to the full expansion of the fourth set of primary leaves, or to trees during a week before or after flower bud swell, a bioregulatory compound in an amount sufficient to increase total biomass, i.e., in an amount sufficient to increase individual constituents of the plant but insufficient to cause harm to the plant, wherein said constituents are selected from the group consisting of protein, lipid, sugar, and essential oil, and wherein said compound is applied in an amount of about 0.005 to 0.3 mg active ingredient per plant seed or seedling or about 1 to 4 grams active ingredient per tree, said compound selected from the group having the structure



(a)

wherein:

X is either oxygen or sulfur,

R_1 and R_2 are lower alkyl containing from 1 to 3 carbon atoms,

n is an integer from 1 to 3,

R_3 and R_4 are independently hydrogen, chlorine, bromine, iodine, lower alkyl containing from 1 to 6 carbon atoms, lower alkoxy containing from 1 to 6 carbons, or condensed benzene ring, and wherein:

if R_3 and R_4 are 3,5-substituents, then the lower alkyl or alkoxy group contain 3 to 6 carbon atoms; and wherein;

if R_3 is hydrogen, the R_4 must be a 4-substituent, with the proviso that R_4 is other than hydrogen; and

(b) and acid addition salt thereof.

4,797,154

PLANT TO CONVERT A METALLIC CHARGE INTO SEMIFINISHED PRODUCTS, AND CONNECTED SMELTING AND CASTING METHOD

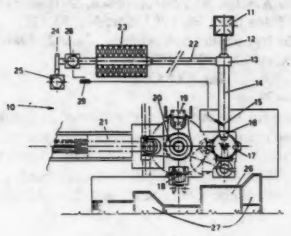
Giampietro Benedetti, Campoformido, and Fulvio Fasano, Gorizia, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Sep. 24, 1987, Ser. No. 100,615

Claims priority, application Italy, Sep. 25, 1986, 83413 A/86

Int. Cl.[4] C22B *4/00*; C21C *5/52*

U.S. Cl. 75—46 **9 Claims**



1. A method for continuously converting metallic charge into semi-finished products comprising the steps of:

continuously feeding the metallic charge to a preheating chamber;

preheating the metallic charge in the chamber;

continuously feeding the preheated charge, at a controlled and adjustable rate, to a furnace;

melting the preheated metallic charge in the furnace to form molten metal;

tapping the furnace at regular intervals at a tapping station, to deliver part of the molten metal from the furnace to a ladle;

refining the molten metal in the ladle at a refining station;

delivering the refined molten metal to a casting station, said casting station comprising a tundish and a continuous caster, the tundish continuously feeding the refined molten metal, at a controlled rate, to the continuous caster; and

casting the molten charge;

wherein first and second ladles are utilized in the method and are respectively engaged with first and second independently rotatable arms of a multi-functional manipulator, the arms being circumferentially and vertically traversable to deliver the ladles to the tapping station, refining station and casting station, with the ladles being simultaneously manipulated so that while the first ladle is engaged in one operation at a particular station, the second ladle may be simultaneously engaged in a different operation at a different station, with the two ladles continuously cycling between the stations, so that various operations may be simultaneously performed.

4,797,155

METHOD FOR MAKING METAL MATRIX COMPOSITES

K. Bhagwan Das, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 756,008, Jul. 17, 1985, Pat. No. 4,699,849. This application Feb. 27, 1987, Ser. No. 20,276

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—229 **22 Claims**

1. A method of producing a metal matrix composite, comprising the steps of:

plastically deforming particles of the metal to impart strain energy thereto;

mixing the strained metal particles with ceramic fibers to form a substantially uniform dispersion of fibers in the metal; and

compacting the mixture at elevated temperatures to form a metal matrix composite of substantially full density without degrading the fibers or reacting the fibers with the metal.

4,797,156

METAL TREATED BY A SOLUTION CONTAINING FERRIC FERROUS SALT

Shoji Yamashita, Aichi, Japan, assignor to I.B.E. Co., Ltd., Aichi, Japan

Division of Ser. No. 655,220, Sep. 27, 1984. This application Apr. 14, 1987, Ser. No. 40,081

Claims priority, application Japan, Mar. 6, 1984, 59-043209

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—251 **5 Claims**

1. A metal having been treated by immersion in an aqueous solution consisting essentially of a ferric ferrous salt and a salt of an alkali metal or a compound containing a metal which belongs to the zinc family.

4,797,157

AMINE SALTS OF LIGNOSULFONATES

Peter Dilling, Isle of Palms; Humbert T. DelliColli, and James E. Davis, both of Hanahan, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 093,312, Sep. 4, 1987, Pat. No. 4,751,247, which is a division of Ser. No. 783,781, Oct. 3, 1985, Pat. No. 4,732,572. This application Jan. 22, 1988, Ser. No. 147,340

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—20 **6 Claims**

1. A printing ink composition comprising a printing paste gel and, as an additive therein, a sulfomethylated lignin amine salt prepared according to the steps of:

(a) ionizing the phenol component of a lignin material in alkaline liquid medium;

(b) methylolating the lignin material in the ortho position of the phenol component;

(c) lowering the pH of the liquid to an acid pH to precipitate the methylolated lignin material;

(d) washing the precipitated lignin material with water to remove inorganic salts and residual reactants therefrom; and

(e) reacting the washed, purified methylolated lignin material with an amine compound and a sulfur-oxygen-containing compound in liquid medium to produce sulfomethylated lignin amine salt.

4,797,158

FLEXIBLE GROUT COMPOSITION AND METHOD

Todd D. Harriett, Elk Grove Village, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 849,048, Apr. 7, 1986, Pat. No. 4,696,699, which is a continuation-in-part of Ser. No. 787,505, Oct. 15, 1985, Pat. No. 4,696,698. This application Jun. 15, 1987, Ser. No. 61,493

Int. Cl.[4] C04B *12/04*

U.S. Cl. 106—74 30 Claims

1. A grout composition for admixture with water to form a gelled grout essentially impermeable to water comprising, where percentages are percent by weight of the composition before admixture with water:

10–80% water-swellable clay;

5–80% solid, essentially non water-swellable particulate filler; and

0.5–35% water soluble silicate,

wherein the essentially non water-swellable particulate filler prevents the breakdown of the grout composition, after admixture of the grout composition with water, after freezing.

4,797,159

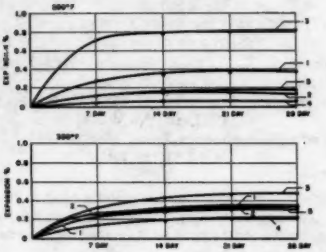
EXPANDABLE CEMENT COMPOSITION

Lloyd B. Spangle, Claremore, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jul. 25, 1986, Ser. No. 890,672

Int. Cl.[4] C04B *7/02, 7/32, 9/00, 11/02*

U.S. Cl. 106—89 22 Claims



1. An expandable cement composition useful for cementing a well casing within the bore of a well, and which sets in no less than about 12 hours, comprising:

(a) a hydratable cement;

(b) 0.25 to 3.75 percent by weight of cement magnesium oxide which has been calcined at between about 1100° C. and about 1500° C., and which has at least about 50% of the particles with a diameter of greater than about 30 microns, so as to produce an expansion in the set cement composition of at least about 0.2% when the set composition is exposed to a temperature of at least about 70° C.

4,797,160

PHASE CHANGE COMPOSITIONS

Ival O. Salyer, Dayton, Ohio, assignor to University of Dayton, Dayton, Ohio

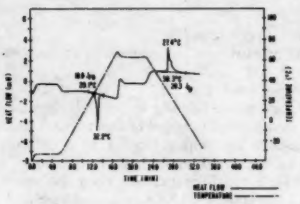
Continuation-in-part of Ser. No. 935,081, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 835,418, Mar. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 646,402, Aug. 31, 1984, Pat. No. 4,617,332. This application Aug. 19, 1987, Ser. No. 88,040

Int. Cl.[4] C04B *24/08*

U.S. Cl. 106—96 18 Claims

1. A composite useful in thermal energy storage comprising a matrix material having incorporated therein a phase change material, said phase change material being a crystalline, straight chain, alkyl hydrocarbon having 14 or more carbon atoms and a heat of fusion greater than 30 cal/g., said composite also comprising a flame retarding agent selected from the group consisting of halogenated hydrocarbons and halogenated phosphates.

14. A composite useful in thermal energy storage comprising a matrix material having incorporated therein a phase change



material, said matrix material being plasterboard and said phase change material being a crystalline, straight chain, alkyl hydrocarbon having 14 or more carbon atoms and a heat of fusion greater than 30 cal/g., said plasterboard also comprising a flame retarding agent incorporated therein said flame retarding agent being selected from the group consisting of halogenated hydrocarbons and halogenated phosphates.

4,797,161

MIXTURE FOR MANUFACTURE OF SHAPED ELEMENTS AND ITS USE

Karl Kirchmayr, Vöcklabruck; Hans-Jürgen Miko, Altmünster; Bruno Watzka, Vöcklabruck, all of Austria; Josef Studinka, Zürich, and Carl Schmitt-Henco, Wesen, both of Switzerland, assignors to Ametex AG, Niederurnen, Switzerland

Filed May 26, 1987, Ser. No. 53,626

Claims priority, application Austria, Jun. 2, 1986, 1474/86; Switzerland, Oct. 13, 1986, 4078/86

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—98 10 Claims

1. A mixture for use in the manufacture of hydraulically-setting, fiber-containing shaped elements, said mixture containing, based on the total weight of the mixture when dry, 5 to 20% by weight fibers 20 to 85% by weight hydraulic binder, 5 to 40% by weight pozzuolanic silicic acid, and 5 to 35% by weight limestone.

4,797,162

PROCESS FOR THE PREPARATION OF PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID N,N'-DIMETHYLIMIDE IN A HIGH-HIDING PIGMENTARY FORM

Ernst Spietschka, Idstein, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,086

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524535

Int. Cl.[4] C09B *67/20*; C07D *471/06*

U.S. Cl. 106—498 3 Claims

1. A process for the preparation of perylene 3,4,9,10-tetracarboxylic acid N,N'-dimethylimide in a high-hiding pigmentary form and a pure red shade, wherein a finely divided, dry perylene-3,4,9,10-tetracarboxylic acid N,N'-dimethylimide prepigment which is prepared in a conventional manner and has a crystallite size of <400 Å is treated with an organic solvent which is liquid in the treatment temperature range stated below and is selected from the series comprising saturated aliphatic brominated or chlorinated hydrocarbons, aromatic hydrocarbons and aromatic brominated or chlorinated

hydrocarbons, in a mill or a disperser at temperatures from 0° C. to 100° C., the organic solvent is the distilled off and the perylene-3,4,9,10-tetracarboxylic acid, N,N'-dimethylimide pigment is isolated.

4,797,163

PROCESS FOR THE PRODUCTION OF TITANIUM DIOXIDE PIGMENTS

Günter Lailach, and Karl-Heinz Schultz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 24, 1987, Ser. No. 88,949

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630220

Int. Cl.⁴ C09C *1/36*

U.S. Cl. 166—437 **10 Claims**

1. In an improved process for the production of titanium dioxide pigments wherein titanium-containing raw materials are chlorinated under reducing conditions to produce titanium tetrachloride and by-product offgases, the titanium tetrachloride is oxidised to titanium dioxide, washed calcined and/or dried,

the improvement comprises burning the by-product offgases to provide at least a part of the heat energy required in the calcining or drying steps.

4,797,164

PROCESS FOR MANUFACTURING A FINE-GRAINED RECRYSTALLIZED SHEET

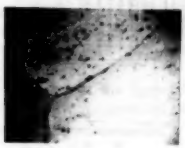
Günter Höllrigl, and Pedro Rodrigues, both of Schaffhausen, Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Sep. 22, 1987, Ser. No. 99,746

Claims priority, application Switzerland, Sep. 30, 1986, 3908/86

Int. Cl.⁴ C22F *1/04*

U.S. Cl. 148—2 **2 Claims**



1. Process for manufacturing a fine-grained recrystallized sheet that is suitable for superplastic forming made of an age-hardenable aluminum alloy, which comprises: providing an aluminum base alloy consisting essentially of at least one age hardening additive and an addition selected from the group consisting of the elements Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, and mixtures thereof having a total concentration of 0.08–1.5 wt %; bringing the alloy into a condition A in which both the alloying elements that lead to age-hardening and the addition elements are at least for the greater part in solid solution; precipitating out in step B the incoherent hardening phases in a temperature range between the solvus T_{gp} and the solvus T_s; and precipitating in a subsequent step C the aluminides of the above mentioned elements as a very dense uniform dispersion by heating in a temperature range between 300° C. and $T_s-30°$ C., whereby any deformation by rolling may take place between condition A and step C at temperatures not higher than $T_s-30°$ C., and in which process the temperature of the sheet below a thickness of $2.5\times d$ does not exceed 200° C.; and heating the sheet at a thickness d to a recrystallization temperature D such that the heating rate is at least 20° C./s until above the recrystallization threshold.

4,797,165

ALUMINUM-LITHIUM ALLOYS HAVING IMPROVED CORROSION RESISTANCE AND METHOD

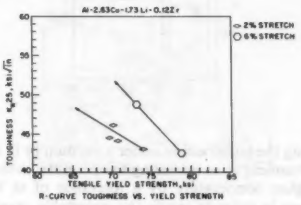
Philip E. Bretz, Plum Boro; Ralph R. Sawtell, Pittsburgh, and Warren H. Hunt, Jr., Monroeville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 594,344, Mar. 29, 1984, Pat. No. 4,648,913. This application Dec. 24, 1984, Ser. No. 685,731

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ C22F *1/04*

U.S. Cl. 148—12.7 A **30 Claims**



17. Method of making aluminum base alloy products having combinations of improved strength, corrosion resistance and fracture toughness, the method comprising the steps of:

(a) providing a lithium-containing aluminum base alloy product consisting essentially of 2.2 to 3.0 wt. % Li, 0.4 to 2.0 wt. % Mg, 0.2 to 1.6 wt. % Cu, 0 to 2.0 wt. % Mn, 0 to 1.0 wt. % Zr, 0.5 wt. % max. Fe, 0.5 wt. % max. Si, the balance aluminum and incidental impurities, the product having imparted thereto, prior to an aging step, a working effect equivalent to stretching so that after an aging step the product has improved combinations of strength and toughness; and

(b) imparting to said product, prior to an aging step, a working effect equivalent to stretching said product an amount greater than about 3.6% at room temperature and aging said product to provide improved combinations of strength and fracture toughness in addition to corrosion resistance.

4,797,166

METHOD FOR PRODUCING AN AT LEAST PARTLY AMORPHOUS ALLOY PIECE

Martin Von Allmen, Zollikofen, and Andreas Blatter, Ostermundigen, both of Switzerland, assignors to Cendres & Metaux, S.A., Biel, Switzerland

Filed May 11, 1987, Ser. No. 47,481

Claims priority, application Switzerland, May 29, 1986, 02177/86

Int. Cl.⁴ C21D *1/26*

U.S. Cl. 148—13.1 **3 Claims**

1. A method for producing an at least partly amorphous alloy piece, comprising the steps of

preparing an alloy composition of at least two elements of appreciably different atomic radius,

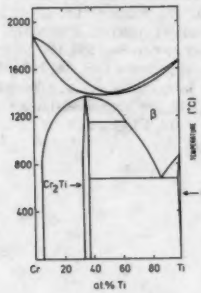
at least one of said elements being elected from the group consisting of Si, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Pd, Ag, Hf, Ta, W, Pt or Au,

the composition being chosen such that a high -temperature solution crystal or high-temperature compound crystal exists for said composition,

heating the composition to an elevated temperature with respect to the glass temperature, so that the composition becomes a high-temperature solution crystal or high-temperature compound crystal,

quenching the composition to a temperature below the glass temperature at such a cooling rate, that the high-temperature solution crystal or high-temperature compound crys-

tal is preserved as a metastable crystal phase in at least a part of the composition,



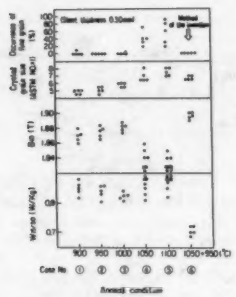
annealing the composition under a vacuum or in an inert gas environment at an annealing temperature, which is below the glass temperature by a tolerance of at least a few degrees in order to vitrify the metastable crystal phase.

4,797,167

METHOD FOR THE PRODUCTION OF ORIENTED SILICON STEEL SHEET HAVING EXCELLENT MAGNETIC PROPERTIES

Hisanobu Nakayama; Shouzaburo Nakashima; Yoshiaki Shimoyama, and Yasukazu Mori, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,834
Int. Cl.[4] H01E *1/04*
U.S. Cl. 148—111 **1 Claim**



1. In a method for the production of a single oriented silicon steel strip which consists of a series of steps of providing a silicon steel slab consisting of 0.010 to 0.10% C, 2.5 to 4.5% Si, 0.02 to 0.15% Mn, a total amount of 0.008 to 0.080% S, Se or S and Se, the remainder being Fe and unavoidable impurities, hot rolling said silicon steel slab into strip, subjecting said hot rolled strip to hot strip annealing, subjecting said hot rolled and annealed strip to more than 2 cold rolling steps including an intermediate annealing between any two of said cold rolling steps, said final cold rolling being carried out with a reduction rate of 40 to about 65% to a specified strip thickness, and finally subjecting said cold rolled strip to decarburizing annealing and the final annealing, the improvement which consists of subjecting said hot rolled strip in said hot strip annealing procedure to a two-step annealing cycle in which the first step consists of heat soaking in a furnace at an elevated temperature range of 1000° to 1200° C., immediately followed by the second step which consists of heat soaking in a furnace at a low temperature range of 750° to 980° C., and said silicon steel strip being maintained at said first step elevated temperature range for a finite period of up to 300 seconds prior to transfer to said second step low temperature range, and finally said silicon steel strip being maintained at said low temperature range for a finite period for up to 600 seconds, and then being cooled to room temperature, the duration of said first and second steps being sufficient to improve the core loss value $W_{15/50}$ and magnetic flux density B_{10} values of said steel strip.

4,797,168

AZIDODINITRO PROPELLANTS

Joseph E. Flanagan, 20883 Kelvin Pl., Woodland Hills, Calif.

Filed Aug. 11, 1986, Ser. No. 895,082
Int. Cl.[4] C06B *25/00*
U.S. Cl. 149—88 **1 Claim**

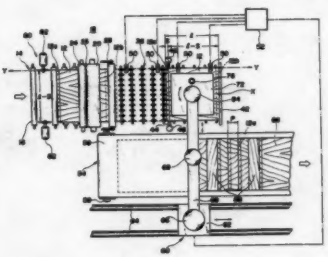
1. A desensitized liquid monopropellant comprising from about 70 to about 90 weight percent 1,1,1-azidodinitroethane, and from about 10 to about 30 weight percent of a desensitizing diluent selected from the group consisting of $N_3C_2H_4OH$, $(N_3CH_2)_2CHOH$, $N_3C(NO_2)_2C_3H_6OH$, $O_2NN(CH_2CH_2N_3)_2$, $N_3C(NO_2)_2C_3H_6N_3$, and mixtures thereof.

4,797,169

METHOD AND APPARATUS FOR ASSEMBLING VENEER SHEET INTO A PLYWOOD

Tadashi Aizawa, Nagoya; Toshimichi Nishiyama, Tokai; Masaru Okawa, Aichi, and Kazuo Nakane, Nishio, all of Japan, assignors to Hashimoto Denki Co. Ltd., Japan

Filed Jun. 29, 1987, Ser. No. 67,696
Claims priority, application Japan, Jul. 2, 1986, 61-155277; Jul. 9, 1986, 61-161453; Nov. 14, 1986, 61-272611
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—64 **28 Claims**



1. A method for assembling veneer sheets into a plywood comprising the steps of:

supplying the veneer sheets having a uniform size to feed means extending in the longitudinal direction;

stopping the veneer sheet on said feed means to orient the forward edge of the veneer sheet precisely in the transverse direction perpendicular to the feed direction;

detecting the position of the veneer sheet in the transverse direction and calculating deviation thereof from a reference line extending along the feed direction by a computer;

transporting the veneer sheet by a transfer unit to a position on an assembling conveyor for fabricating a stepped lamination, said assembling conveyor extending parallel to said feed means and adapted to be operated intermittently, and said transfer unit including means for holding the veneer sheet during the transportation;

detecting length of movement of said assembling conveyor and comparing said length with a stored value by said computer for determining an error; and

controlling said transfer unit by said computer for correcting

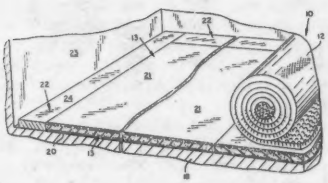
said deviation and said error while transporting the veneer sheet.

4,797,170

SYSTEM FOR HOLDING CARPET IN PLACE WITHOUT STRETCHING

Merle R. Hoopengardner, Lafayette, Calif., assignor to JacTac, Inc., Lafayette, Calif.

Filed Jul. 7, 1986, Ser. No. 882,173
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] E04B *2/00*
U.S. Cl. 156—71 13 Claims



1. A method of installing a carpet with a carpet cushion, comprising:
applying an adhesive to a floor surface;
positioning a carpet cushion on the floor surface to adhere it thereto and trimming as required, said carpet cushion having a preapplied pressure-sensitive adhesive on its upper surface and a removable release film on the pressure-sensitive adhesive;
positioning the carpet on top of the release film on the carpet cushion and cutting and seaming the carpet as required;
folding back the carpet and removing the release film from the exposed area of the carpet cushion;
pressing the carpet down onto the exposed pressure-sensitive adhesive on the upper surface of the carpet cushion;
folding back another portion of the carpet and removing the release film from that area and then pressing that portion of the carpet onto the exposed pressure-sensitive adhesive of the carpet cushion; and
performing final trimming at the carpet edges as required when the entire carpet has contacted the adhesive.

4,797,171

COATED FABRIC AND METHOD OF MAKING THE SAME

Paul T. Van Gompel, Hortonville, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 690,350, Jan. 10, 1985, Pat. No. 4,753,840.
This application Feb. 18, 1988, Ser. No. 157,429
Int. Cl.[4] B65C *9/25*
U.S. Cl. 156—322 11 Claims

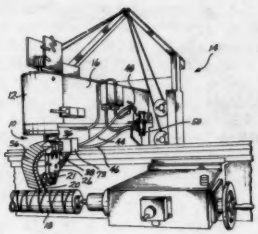
1. A method of making a coated fabric comprising:
providing a base ply of nonwoven fiber matrial,
forming in the base ply material a pattern of densified and undensified portions, the densified portions extending to at least one surface, designated the coating surface,
then providing a thermoplastic film in a heat-softened condition,
contacting the heat-softened thermoplastic film with the coating surface of the base ply,
controlling the depth of penetration of the heat-softened thermoplastic film into the base ply to a depth less than the entire depth of the base ply by maintaining the temperature of the film and the contact pressure between the film and the base ply at predetermined values, thereby forming the film into a surface coating only on the coating surface of the base ply, and thereafter allowing the surface coating of film the cool.

4,797,172

FILAMENT PREHEAT APPARATUS

Michael R. Hebert, and Arnold J. Lauder, both of Winnipeg, Canada, assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 12, 1988, Ser. No. 155,618
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—425 4 Claims



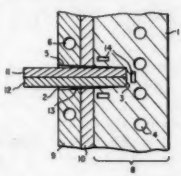
1. For use in connection with a filament winding machine and the like that has a movable payout assembly for feeding a filament or similar prepregged material to a winding mandrel, an apparatus for preheating said filament and mandrel during the winding process, comprising:
heating means, mounted to said payout assembly, for providing a heated airflow; and
an air duct member having an air inflow and an air outflow end, said inflow end being positioned relative to said heating means in a manner so that said heated airflow is delivered into said inflow end, wherein said airflow passes through said duct member and exits through said outflow end, and further, said duct member is shaped so that said outflow end is normally positioned near the location where said filament contacts said mandrel, so that said exiting air is directed against both said filament and mandrel, and still further, said duct member is rotatable about said inflow end, in a manner so that said outflow end may be swung away from said normal position, to direct said exiting airflow away from said filament and mandrel.

4,797,173

APPARATUS FOR FACE WELDING BUNDLES OF THERMOPLASTIC MOLDINGS UNDER PRESSURE

Heinz Gross, Muhltal; Klaus E. Pohlmann, and Harmut Schikowsky, both of Darmstadt, all of Fed. Rep. of Germany, assignors to ROHM GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,649
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522190
Int. Cl.[4] B29C *65/18, 65/26, 65/70*
U.S. Cl. 156—498 11 Claims



1. An apparatus for face welding a bundle of thermoplastic moldings the end faces of which lie in a plane and the end face

edges of which are juxtaposed in a coplanar fachion, said apparatus comprising:

(a) a heatable and coolable plate that can be pressed against the end face of the bundle and that has grooves therein, said grooves being sized, shaped, and positioned to correspond to the cross-section of the bundle and being a little bit wider than the thickness of the coplanarly juxtaposed end face edges that are to be sunk into the grooves;

(b) first means for heating the floor and the lower part of the walls of said grooves up to or above the melting temperature of the plastic, thereby melting the adjacent coplanarly juxtaposed end face edges of the theroplastic moldings;

(c) second means for thermally insulating the entry of said grooves from the floor of said grooves on all sides;

(d) third means for confining the melted thermoplastic resin in said grooves; and

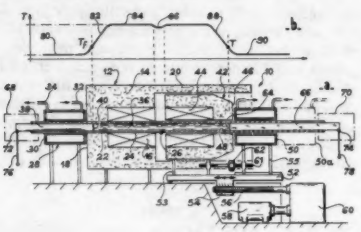
(e) fourth means for applying pressure through said heatable and coolable plate to the end face of the bundle, thereby pressurizing the melted thermoplastic resin confined in said grooves.

4,797,174

PROCESS AND APPARATUS FOR THE CONTINUOUS CHECKING OF THE SUPERMELTING OF THE SOLIDIFICATION FRONT OF A MONOCRYSTAL DURING FORMATION AND APPLICATION TO THE CHECKING OF THE GROWTH OF A CRYSTAL

Jean Comera, Gieres; Pierre Contamin, Claix; Jean-Jacques Favier, Grenoble, and Guy Marquet, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 16, 1987, Ser. No. 38,996
Claims priority, application France, Apr. 28, 1986, 86 06107
Int. Cl.[4] C30B *13/16, 35/00*
U.S. Cl. 156—616.1 **13 Claims**



1. An apparatus for forming and continuously checking said monocrystal part as it is being formed from that portion of a material mass which is heated to a liquid state comprising:

means for heating a portion of a solid material mass to create a liquid state in a portion thereof that lies between a solid part of said material mass and a monocrystal part of said material mass to produce

a first fixed solid-liquid interface located between said solid part and said liquid state and

a second solid-liquid interface comprising a solidification front located between said liquid state portion and said monocrystal part;

means for moving said solidification front;

means for measuring the potential at a first point on said solid part at a distance from said first interface to obtain a first potential;

means for measuring the potential at a second point on said monocrystal part at a distance from said second interface to obtain a second potential; and

means for measuring a potential difference between said potentials at said first and second points and, in response thereto, controlling said means for moving said solidification front.

8. A process for the continuous checking of the formation of a monocrystal part as it is being formed from that portion of a material mass which is heated to a liquid state comprising the steps of:

(a) heating a portion of said material mass to create a liquid state in a portion thereof that lies between a solid part of said material mass and said monocrystal part of said material mass and establishing

a first fixed solid-liquid interface located between said solid part and said liquid state, and

a second solid-liquid interface consistuting a solidification front located between said liquid state and said monocrystal part;

(b) causing said solidification front to move to create a mobile solidification front at which supercooling occurs as said crystal part is continuously forming;

(c) measuring the potential of said solid part at a first point on said solid part to obtain a first potential;

(d) measuring the potential of said monocrystal part at a second point on said monocrystal to obtain a second potential;

(e) comparing said first and second potentials to obtain a potential difference; and

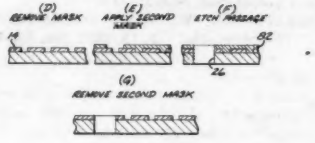
(f) determining a temperature deviation ΔT at said solidification front utilizing said potential difference.

4,797,175

METHOD FOR MAKING SOLID ELEMENT FLUID FILTER FOR REMOVING SMALL PARTICLES FROM FLUIDS

M. Edmund Ellion, Arcadia; Philip A. Donatelli, Marina del Rey, and George Wolff, Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 23,175, Mar. 9, 1987. This application Oct. 26, 1987, Ser. No. 112,359
Int. Cl.[4] B44C *1/22*; C23F *1/02*; C03C *15/00*; B05D *5/00*
U.S. Cl. 156—644 **3 Claims**



1. A method for preparing a filter element for use in a fluid filter, comprising the steps of:

providing a flat plate;

depositing a mask onto said flat plate, said mask having a pattern therein defining a plurality of channels extending transversely across the face of the flat plate;

depositing a material over said mask to form a deposited layer, the thickness of the deposited layer being less than about 10 micrometers, the deposited layer having a pattern comprising a plurality of channels; and

removing the mask to form a filter element.

4,797,176

THERMOSETTING SIZE PRESS COMPOSITION

John E. Katchko, Barrington; Charles W. Strobel, Schaumburg, and Thomas H. Plaisance, Wilmette, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 10, 1987, Ser. No. 83,166
Int. Cl.[4] D21H 3/36
U.S. Cl. 162—135 22 Claims

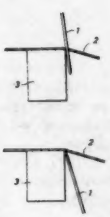
1. A thermosetting size applyable to paper in a size press and curable at a temperature not in excess of about 260° F. for 10 seconds, said size comprising an aqueous emulsion comprising water having suspended therein: (1) aqueous emulsion copolymer particles of monoethylenically unsaturated monomers comprising hydroxy-functional monomer, said copolymer having an hydroxy number of from about 40 up to about 300, and the balance of said monomers providing a water insoluble polymer having a glass transition temperature of from about −20° C. to about 50° C., said emulsion having a pH greater that about 2.5 up to about 7; (2) a stoichiometric deficiency of an aminoplast cross-linking agent providing a ratio of hydroxy groups to N-methylol curing groups of from 4:1 to 1.2:1; and (3) an acid curing catalyst uniformly distributed in said size.

4,797,177

METHOD OF CUTTING AN ORGANIC MEMBRANE

Toshio Kaya, Iwakuni, and Makoto Fujimoto, Waki, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 1, 1988, Ser. No. 151,204
Claims priority, application Japan, Feb. 3, 1987, 62-23750
Int. Cl.[4] B44C 1/22; B29C 37/00
U.S. Cl. 156—630 3 Claims



1. In the process of producing a device in which an organic membrane is adhered to, or intimately adhered to, a frame or a substrate, a method of cutting the organic membrane which comprises bringing an injection syringe-like needle into contact with, or approach to, the lateral end surface of the frame and while moving it along said lateral end surface, injecting an organic solvent capable of dissolving the organic membrane from the needle, whereby the membrane is cut along the frame by dissolving.

4,797,178

PLASMA ETCH ENHANCEMENT WITH LARGE MASS INERT GAS

Vu Q. Bui, Endicott; Kevin K. Chan, Staten Island; Joseph G. Hoffarth, Binghamton, all of N.Y., and Vicki J. Maluey, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1987, Ser. No. 49,254
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06; B29C 37/00
U.S. Cl. 156—643 9 Claims

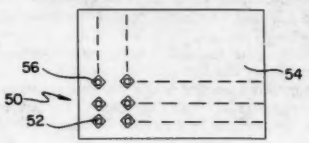
3. A method of plasma cleaning a surface comprising,
subjecting said surface to a plasma process gas which includes carbon tetrafluoride and oxygen,
whereby non-polymerized organics are removed and polymerized fluorocarbons are formed on said surface,
simultaneously subjecting said surface to bombardment by a large mass inert gas, whereby said polymerized fluorocarbons are removed,
thereby enhancing the action of process gas.

4,797,179

FABRICATION OF INTEGRAL LENSES ON LED DEVICES

George P. Watson, Plainfield, and Kathleen Meehan, Somerville, both of N.J., assignors to Lytel Corporation, Somerville, N.J.

Filed Jun. 9, 1987, Ser. No. 60,772
Int. Cl.[4] H01L 21/306; B44C 1/22
U.S. Cl. 156—647 14 Claims



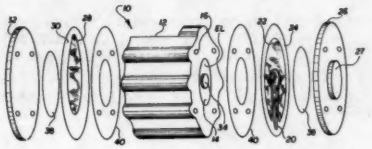
1. A method of fabricating LED devices from a wafer having LED's defined therein, comprising
forming a substantially circular first masking portion over each area of said wafer from which radiation would be emitted; and
forming a second masking portion on said wafer to define unmasked portions associated with said first masking portions; said unmasked portions being non-circular and shaped relative to a chemical etchant so that said chemical etchant can etch said wafer to produce mesas having substantially circular cross sections.

4,797,180

METHOD FOR THE DETECTION OF NOXIOUS GASES

Alan A. Schneider, Reisterstown; David A. Stewart; Joseph D. Jolson, both of Baltimore; RaeAnn M. Auel, Westminster, and John F. Price, Owings Mill, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Division of Ser. No. 760,144, Jul. 29, 1985, Pat. No. 4,707,242, which is a continuation-in-part of Ser. No. 646,316, Aug. 30, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,134
Int. Cl.[4] G07N 27/46
U.S. Cl. 204—1 T 15 Claims



1. A method for quantitatively detecting a noxious gas in air in an electrochemical cell comprising a first working electrode, a second working electrode, a counter electrode and a reference electrode, said first working electrode comprising a gas diffusion membrane having bonded thereto a catalytic portion electrochemically reactive with the noxious gas and said second working electrode having electrochemical activity with oxidation/reduction products produced at the first working electrode; an electrolyte in contact with the catalytic portion of the first working electrode and in contact with second working electrode, the counter electrode and the reference electrode; and means for containing the electrolyte and said electrodes; said method comprising:

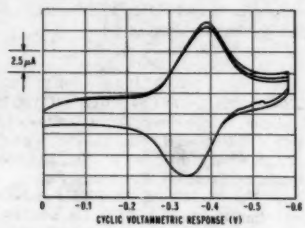
(a) feeding an air sample containing the noxious gas to be detected to the first working electrode of said cell;
(b) maintaining the first working electrode by means of a potentiostat at a fixed potential relative to the reference electrode of from about 1.0 to 1.8 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell to oxidize the noxious gas;
(c) maintaining the second working electrode by means of a potentiostat at a fixed potential relative to the reference electrode of from above 1.0 to about 2.2 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell to further oxidize/reduce the oxidation/reduction products of the noxious gas to minimize the contamination of the electrolyte and the counter electrode, the fixed potential on said second working electrode being maintained at a voltage higher than the fixed potential being maintained on said first working electrode; and
(d) measuring the current flowing between said first working electrode and said counter electrode to quantitatively determine the amount of the noxious gas in said air, said measured current being a measure of the concentration of the noxious gas in said air sample being detected.

4,797,181

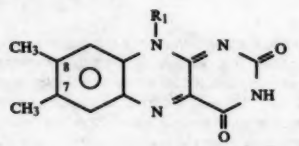
FLAVIN COFACTOR MODIFIED ELECTRODES AND METHODS OF SYNTHESIS AND USE

Charles N. Durfor, Rockville, Md.; Mark L. Bowers, Watertown, and Barbara A. Yenser, Essex, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 3, 1987, Ser. No. 81,251
Int. Cl.[4] B01D *59/40*
U.S. Cl. 204—1 T **25 Claims**



8. A method of effecting electron transfer between an electrode having a working surface of an electrically conducting or semiconducting material and an enzyme comprising the steps of:
modifying the working surface of the electrode by electrochemically bonding to an existing or derivatized outer oxide or hydroxyl layer on the working surface, by means of a mercaptosilane linking group, a redox active material derived from a redox active flavin -compound having the formula



wherein the redox active material is selected to activate a protein moiety of the enzyme, R_1 being a ribose derivative selected to provide the selected redox active material, and the redox active material is bonded to the sulfur atom of the linking group through the 8-alpha methyl position on the redox active material;
immersing the modified working surface of the electrode in an electrolyte solution containing the protein moiety of the enzyme; and
applying an electric potential to the electrode sufficient to effect the electron transfer between the electrode surface and the enzyme through the redox active material.

4,797,182

ELECTRODE WITH A PLATINUM METAL CATALYST IN SURFACE FILM AND ITS USE

Henri B. Beer, Heide-Kalmthout, and Dirk Arnouts, Essen, both of Belgium, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Apr. 13, 1987, Ser. No. 37,661
Claims priority, application European Pat. Off., Apr. 17, 1986, 86105300.7
Int. Cl.[4] C25D *1/00*
U.S. Cl. 204—14.1 **9 Claims**

8. The method of carrying out an electrolytic process wherein oxygen is evolved at an anode during said process at a current density exceeding 3.5 kA per m^2 of projected anode surface, which method comprises contacting with an electrolyte an electrode and connecting said electrode as an anode, said electrode being manufactured by providing an electrode substrate of film-forming metal, and then establishing an integeral surface film of film-forming metal oxide grown from the substrate, said electrode manufacture including incorporating electrocatalyst in said surface film, said electrocatalyst comprising two superimposed layers, with a first layer containing platinum metal and a second layer containing an oxide of iridium, rhodium, plalladium or ruthenium, with said first layer being next to the substrate and said second layer coforming the outer surface of the intergral surface film with the film-forming metal oxide.

4,797,183

ELECTROPLATED COMPOSITE OF ZINC AND ORGANIC POLYMER

Yuzo Yamamoto, Wakayama; Hiroyuki Nagamori, Utsunomiya, and Kozo Kitazawa, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 107,368
Claims priority, application Japan, Oct. 17, 1986, 61-247093
Int. Cl.[4] C25D *15/00*; 204 *16, 55.1*
U.S. Cl. 204—16 **17 Claims**

1. An electroplated composite coating which comprises 70 to 99.9 percent by weight of an organic polymer,
said polymer being soluble in water and anionic, cationic or amphoteric and dispersed in the electroplated crystal grains or grain boundaries of the zinc and/or the zinc alloy and having a weight-average molecular weight of 1,000 to 1,000,000,
said polymer having at least one aromatic ring and 1 to 10 hydroxyl groups on the average per molecular weight unit of 500,
said polymer containing therein a polar group selected from the group consisting of:
a sulfo group,
a phosphoric acid group of the formula —O—PO(OR)2,
a phosphorous acid group of the formula —O—P(OR)2,
a phosphonic acid group of the formula —PO(OR)2,
a phosphonous acid group of the group —P(OR)2,
phosphinic acid group of the formula —RPO(OR),
a phosphinous acid group of the formula —PR(OR),
a tertiary amino group of the formula —NR1R_2,
a quaternary ammonium group of the formula [—NR1R2R3.X] —NR1R2R3 X and a
carboxyl group having the formula —COOH,
in which R is hydrogen or a hydrocarbon group and R1, R2 and R3 each are a straight or branched alkyl, a straight or branched hydroxyalkyl or an aromatic ring and X is a counter anion,
the sulfo group being contained therein on the average in an

amount of 0.1 to 4 sulfo groups per molecular weight unit of 500, the other groups being contained therein on the average in a total amount of 0.1 to 5 groups per molecular weight unit of 500,

the main chain bridging between two aromatic rings being at least one of C—C linkage, C=C linkage and an ether linkage (C—O—C).

4,797,184

PROCESS FOR PRODUCING 7,7,8,8-TETRACYANOQUINODIMETHANE

Tomio Nakamura, Ichikawa; Katsuaki Kikuchi, and Takeshi Inagaki, both of Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1988, Ser. No. 140,562

Claims priority, application Japan, Jan. 12, 1987, 62-3189

Int. Cl.[4] C25B *3/02*

U.S. Cl. 204—59 R **6 Claims**

1. A process for producing 7,7,8,8-tetracyanoquinodimethane, which comprises subjecting 1,4-bis-(dicyanoethylene)-cyclohexane to anodic oxidation in a solvent.

4,797,185

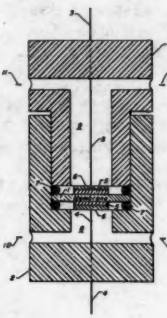
HYDROGEN SEPARATION AND ELECTRICITY GENERATION USING NOVEL ELECTROLYTE MEMBRANE

Anthony J. Polak, Lake Zurich, and Sandra Petty-Weeks, Naperville, both of Ill., assignors to Allied-Signal Inc., Morris-township, Morris County, N.J.

Continuation of Ser. No. 756,889, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,351, Dec. 28, 1984, abandoned. This application Jul. 6, 1987, Ser. No. 70,620

Int. Cl.[4] C25B *1/02, 9/00*

U.S. Cl. 204—129 **17 Claims**



1. Apparatus for performing an electrochemical process involving a gaseous mixture having a component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions or of combining with hydrogen ions, comprising:

(a) a thin film macroscopically homogeneous polymer blend membrane possessing a high protonic conductivity and which is formed by removing the solvent from a solution of a phosphoric acid and an organic polymer, wherein said phosphoric acid is present in the blend in an amount in the range of about 10% to about 70% by weight of the blend and is selected from a group consisting of hypophosphoric acid, metaphosphoric acid, orthophosphoric acid, pyrophosphoric acid, and polyphosphoric acid, and wherein said organic polymer is present in the blend in an amount in the range of about 90% to about 30% by weight of the blend and is selected from a group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylenimine, poly-(ethylene glycol), cellulose acetate, poly(ethyloxazoline), poly(vinyl sulfonic acid), poly(vinyl pyridine), poly(vinyl pyrrolidone), polyimide, poly(acrylamide), poly(acrylic acid), poly(N-isopropyl acrylamide), poly(N,N-dimethyl acrylamide), and copolymers having as repeat units the monomer units used in the polymers of said group.

(b) a membrane housing comprising a first gas chamber and a second gas chamber separated by a partition comprising said membrane, said membrane having a first surface in common with the first gas chamber and a second surface in common with the second gas chamber;

(c) two separate portions of catalytic agent effective to promote dissociation and combination, a first portion in contact with said first surface and a second portion in contact with said second surface of said membrane; and

(d) means for forming electrical connection in operative contact with said catalytic agent at said first surface and with said catalytic agent at said second surface.

4,797,186

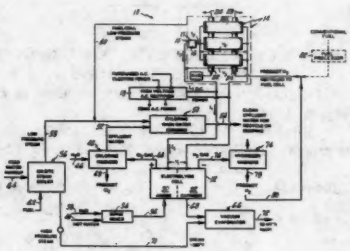
METHOD AND APPARATUS FOR OPERATING A FUEL CELL IN COMBINATION WITH AN ELECTROCHEMICAL CELL TO PRODUCE A CHEMICAL PRODUCT

Alexander H. Levy, Bloomfield, and Kenneth Lipman, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 501,239, Jun. 3, 1983, abandoned. This application Mar. 20, 1987, Ser. No. 27,038

Int. Cl.[4] H01M *8/06*; C25B *1/02, 15/00*

U.S. Cl. 204—129 **23 Claims**



1. A method for operating a first electrochemical fuel cell in combination with a second electrochemical cell which employs a direct current converter, the fuel cell consuming a fuel and an oxidant to produce electrical power, the second electrochemical cell producing a chemical product and an oxidant as a result of the consumption of electrical power, which comprises:

operating the electrochemical cell at a first current and at a first voltage to produce a chemical product and an oxidant;

supplying the oxidant to the fuel cell for consumption of at least a portion of the oxidant in the fuel cell;

operating the fuel cell to consume fuel and at least a portion of the oxidant to produce direct current electrical power at a second current and at a second voltage which is independent of the voltage of the electrochemical cell;

converting the power output of the fuel cell which is at the second current and the second voltage to a third current and an output voltage which matches the first voltage of the electrochemical cell by flowing current intermittently through a direct current converter responsive to the power output of the fuel cell and the fuel available to the fuel cell; and,

supplying the third current to the electrolysis cell to provide at least a portion of the power required to produce the

chemical product and the oxidant at the first current and the first voltage.

4,797,187

SEMI-PERMEABLE MEMBRANES PREPARED VIA REACTION OF CATIONIC GROUPS WITH NUCLEOPHILIC GROUPS

Thomas E. Davis, Lafayette, Calif.; Donald L. Schmidt, Midland, Mich.; Jee I. Kau, Concord, Calif.; Ritchie A. Wessling, Midland, Mich.; Sharon S. Whipple, Sanford, Mich.; Richard F. Fibiger, Midland, Mich., and Dale M. Pickelman, Auburn, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 790,287, Oct. 22, 1985, Pat. No. 4,704,324, which is a continuation-in-part of Ser. No. 719,037, Apr. 3, 1985, abandoned, which is a continuation of Ser. No. 313,051, Oct. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,356, Jun. 24, 1980, abandoned. This application Aug. 17, 1987, Ser. No. 86,123

Int. Cl.[4] C05B *7/00*

U.S. Cl. 204—180.2 **26 Claims**

1. Method of improving the selectivity of a semi-permeable membrane comprising:

(a) contacting the membrane with a first reactive, ionic compound in an aqueous diluent while maintaining chemical potential gradient so as to deposit the ionic compound on membrane surface; and

(b) maintaining chemical potential gradient while contacting the membrane in an aqueous diluent with a second reactive, ionic compound of a charge opposite to the first compound, so as to form a coacervate.

4,797,188

SHEET TYPE ELECTRODE FOR USE IN MEASUREMENT OF IONS

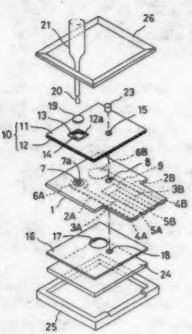
Katsuhiko Tomita, Miyanohigashi, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Nov. 24, 1987, Ser. No. 124,909

Claims priority, application Japan, Mar. 16, 1987, 62-61633

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—414 **9 Claims**



1. In an eleotrode assembly for the measurement of ions, in which an ion-selective response membrane is formed on an upper surface of an insulating support layer, the improvement comprising;

a pair of sheet members bound together to form the support layer, and

means for providing the ion-selective response membrane on the support layer including an adhesive mixture-containing solvents that are compatible with a sealing adhesion to the support layer to form ion-selective response membrane.

4,797,189

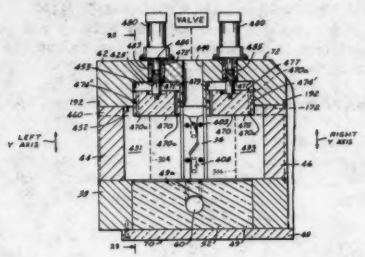
PRESSURE BALANCED SEALING PISTONS FOR CATHODES IN AN ELECTROLYTE CHAMBER

Edmund R. Hinman, Monroe, and Richard A. Jack, Granby, both of Conn., assignors to Airfoil Textron Inc., Lima, Ohio

Continuation of Ser. No. 29,022, Mar. 23, 1987, abandoned. This application Dec. 11, 1987, Ser. No. 131,759

Int. Cl.[4] B23H *3/00, 9/10*

U.S. Cl. 204—224 M **12 Claims**



1. An electrolyte chamber for electrochemically machining a workpart positioned therein as an anode comprising cathode means movably disposed in the chamber for movement in a direction generally toward the workpart, electrolyte inlet means in the chamber for introducing pressurized electrolyte into the chamber, sealing means moveable in opposite directions in the chamber toward or away from the cathode means to close off or open a space between the cathode means and electrolyte chamber forming means, means for moving the sealing means in the chamber in said opposite directions and means for substantially balancing electrolyte pressure on the sealing means in the opposite directions.

4,797,190

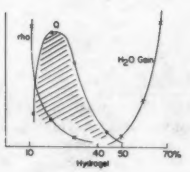
IONIC SEMICONDUCTOR MATERIALS AND APPLICATIONS THEREOF

Robert L. Peck, Lebanon, Conn., assignor to T and G. Corporation, Lebanon, Conn.

Filed Oct. 6, 1986, Ser. No. 915,994

Int. Cl.[4] C25B *13/00*

U.S. Cl. 204—296 **18 Claims**



1. An ionic semiconductor having an ion transport rate which is temperature dependent, said semiconductor comprising an inert man-made polymeric matrix material and a hydrogel, the molecules of the hydrogel being substantially uniformly dispersed within said matrix material to form a composite structure wherein contact between hydrogel molecules is minimized by the matrix and the formation of channels is thereby limited, the composite allowing the transfer of ions and preventing the passage of un-ionized matter, the hydrogel comprising 10 to approximately 50% by weight of the dry composite, there being sufficient bonding between the hydrogel molecules and the matrix material to prevent substantial leach-out of hydrogel molecules from the composite.

4,797,191

MEASURING DEVICE FOR DETERMINATION OF THE ACTIVITY OR OF THE CONCENTRATION OF IONS IN SOLUTIONS

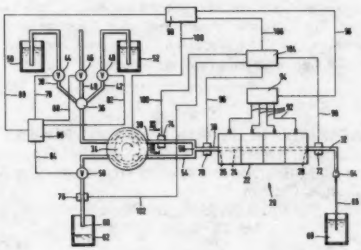
Klaus Metzner, Bad Homburg; Detlef Westphal, Oberursel; Wolfgang Allendörfer, Bad Homburg; Reinhard Hahnel, Lollar, and Hans-Dietrich Polaschegg, Oberursel, all of Fed. Rep. of Germany, assignors to Fresenius AG, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 732,022

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416956

Int. Cl.[4] G01N 27/26

U.S. Cl. 204—411 15 Claims



1. A measuring device for determination of the activity or the concentration of ions in solution comprising:

a flow channel (24) having a reference electrode and at least one measuring electrode, said flow channel having a first end (26) and a second end (28);

a first line (30) connecting said first end of said flow channel to at least one calibrating liquid container (50, 52) through first valve means (44, 46, 48);

first pumping means (34) interposed in said first line (30) between said first valve means (44, 46, 48) and said first end (26) of said flow channel (24);

a waste line (54) connected to said first line adjacent said first end (26) of said flow channel (24), said waste line having second pumping means and second valve means (58);

a sample feed line (32) connected to said second end (28) of said flow channel for providing a sample to said flow channel;

first and second sensors (70, 72) arranged in said first and second ends of said flow channel, respectively, for detecting the flowing fronts of liquids, said sensors comprising electro-optical sensors capable of discriminating between the presence and absence of liquids and among liquids of differing properties;

control means coupled to said sensors, pumping means, and valve means for controlling said pumping means and valve means so that, sequentially, a calibrating liquid is fed from said calibrating liquid container (50, 52) through said first line (30) and said flow channel via said first end by means of said first pumping means (34) until the flowing front of said calibrating liquid is detected by said second sensor (72), the calibrating liquid is removed from said flow channel out of said first end by said second pumping means and delivered to said waste line, a sample is fed from said sample container (68) through said sample feed line (32) and said flow channel (24) via said second end by means of said second pumping means until the flowing front of said sample is detected by said first sensor (70) and, the sample is removed from said flow channel out of said first end by said second pumping means and delivered to said waste line.

4,797,192

ION SELECTIVE ELECTRODE APPARATUS WITH AN EARTH ELECTRODE

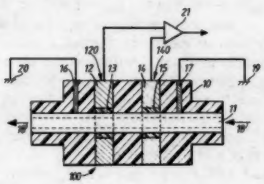
Toshio Takiguchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 16, 1987, Ser. No. 74,188

Claims priority, application Japan, Jul. 18, 1986, 61-169324; Jul. 22, 1986, 61-170822

Int. Cl.[4] G01N 27/26

U.S. Cl. 204—412 8 Claims



1. An apparatus for measuring ion activity in a solution to be examined, comprising:

a block having a conduit through which the solution flows;

reference electrode means, disposed in said block so as to contact the solution flowing through the conduit, for generating a first potential as a reference potential of the solution independent of the activity of the solution;

ion selective electrode means, disposed adjacent to said reference electrode means in said block so as to contact the solution flowing through the conduit for generating a second potential dependent on the activity of the solution;

first earth electrode means disposed in said block in electrical contact with the solution flowing through the conduit and downstream of both said reference electrode means and said ion selective electrode means; and

second earth electrode means disposed in said block in electrical contact with the solution flowing through the conduit and upstream of both said reference electrode means and said ion selective electrode means.

4,797,193

ANALYZER FOR IONIC ACTIVITY MEASUREMENT

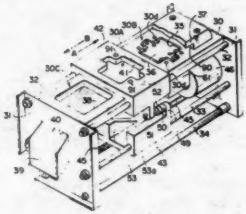
Tadashi Uekusa; Takashi Koizumi, and Nobuhiko Amano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 16, 1987, Ser. No. 3,989

Claims priority, application Japan, Jan. 16, 1986, 61-7079

Int. Cl.[4] G01N 27/28

U.S. Cl. 204—416 5 Claims



1. An analyzer for measuring ionic activity by use of an ionic activity measuring device provided with at least one ion selective electrode pair for generating potential corresponding to ionic activity of a predetermined ion, and a porous bridge disposed to make the electrodes of the ion selective electrode pair communicate with each other, the analyzer comprising:

(i) a device supporting base provided with a liquid feeding section for feeding a reference solution in drops to one of said electrodes of said ion selective electrode pair of said ionic activity measuring device and feeding a sample solution in drops to the other thereof, a potential difference measuring section, and a device ejecting section for ejecting said ionic activity measuring device,

(ii) a device holder for holding said ionic activity measuring device on and connected to said device supporting base,

(iii) a holder movement means for moving said device holder for sending said ionic activity measuring device, which is held by said device holder, sequentially to the respective sections of said device supporting base, wherein said holder movement means comprises a holder movement base releasably associated with said device holder so that said holder movement base is released from said device holder for further movement in a first direction away from said device holder after said holder movement base moves said device holder up to said potential difference measuring section in said first direction

(vi) potential difference measuring probes formed for contact with said electrodes of said ion selective electrode pair for measuring a difference in potential between said electrodes, and

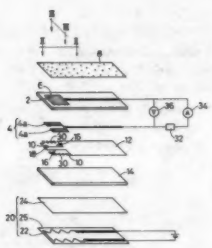
(v) a probe movement means mechanically interlocked with said holder movement means for making said probes contact with said electrodes when said ionic activity measuring device has been transferred to said potential difference measuring section of said device supporting base, and moving said probes away from said electrodes before said ionic activity measuring device is moved out of said potential difference measuring section.

4,797,194

ELECTROCHEMICAL ELEMENT

Syunzo Mase, Tobishima, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 899,815, Aug. 25, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,225
Claims priority, application Japan, Aug. 30, 1985, 60-192568
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—425 **32 Claims**



9. An electrochemical element, comprising:

a planar solid electrolyte body;

at least two electrodes including a first electrode and a second electrode which are disposed on said planar solid electrolyte body;

a first means for defining a thin flat space which has a predetermined diffusion resistance to restrict diffusion of a measurement gas to said first electrode, said thin flat space communicating with a measurement-gas space in which said measurement gas exists via a gas inlet aperture, said gas inlet aperture being formed through said electrochemical element in a plane normal to and intersecting a plane of said thin flat space, such that an inlet is formed in said thin flat space at a portion of said gas inlet aperture which intersects said thin flat space, said first electrode being substantially exposed to said measurement gas in said thin flat space, said means for defining a thin flat space including two opposed flat surfaces parallel to said plane of said thin flat space, said first electrode being disposed on a first of said two opposed flat surfaces and contacting a first portion of said first opposed flat surface, such that said first electrode is spaced a predetermined distance away from said inlet of said thin flat space in a direction parallel to said plane of the thin flat space, said measurement gas being introduced through said inlet into said thin flat space; and

a second means for substantially defining the thickness of said thin flat space, said second means comprising ceramic bridging means disposed in said thin flat space, said ceramic bridging means contacting a second portion of said first flat surface and the second surface of said two opposed flat surfaces, thereby bridging a gap between said two opposed flat surfaces and being in a non-contacting relationship with said first electrode.

4,797,195

THREE ZONE HYDROCRACKING PROCESS

Simon G. Kukes, Naperville; L. Charles Gutberlet, Wheaton, and Jeffrey T. Miller, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 26, 1988, Ser. No. 160,683
Int. Cl.[4] C10G *65/10*
U.S. Cl. 208—59 **16 Claims**

1. A process for hydrocracking a hydrocarbon feedstock with hydrogen at hydrocracking conversion conditions in a plurality of reaction zones in series which comprises:

(a) contacting said feedstock in a first reaction zone with a first reaction zone catalyst comprising a nickel component and a molybdenum component deposed on a support component consisting essentially of a refractory inorganic oxide;

(b) contacting the effluent from said first reaction zone in a second reaction zone with a second reaction zone catalyst comprising a nickel component and a tungsten component deposed on a support component consisting essentially of an alumina component and a crystalline molecular sieve component; and

(c) contacting the effluent from said second reaction zone in a third reaction zone with a third reaction zone catalyst comprising a cobalt component and a molybdenum component deposed on a support component comprising a silica-alumina component and a crystalline molecular sieve component.

4,797,196

HYDROCRACKING PROCESS USING SPECIAL JUXTAPOSITION OF CATALYST ZONES

Simon G. Kukes, Naperville; L. Charles Gutberlet, Wheaton, both of Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 26, 1988, Ser. No. 160,680
Int. Cl.[4] C10G *65/10*
U.S. Cl. 208—59 **19 Claims**

1. A process for hydrocracking a hydrocarbon feedstock with hydrogen at hydrocracking conversion conditions in a plurality of reaction zones in series which comprises:

a. contacting said feedstock in a first reaction zone with a first hydrocracking catalyst comprising a nickel component and a tungsten component deposed on a support component consisting essentially of an alumina component and a crystalline molecular sieve component;

b. contacting the effluent from said first reaction zone in a second reaction zone with a second hydrocracking catalyst comprising a cobalt component and a molybdenum component deposed on a support component comprising a silica-alumina component and a crystalline molecular sieve component.

c. contacting the effluent from said second reaction zone in a third reaction zone with said first hydrocracking catalyst.

4,797,197

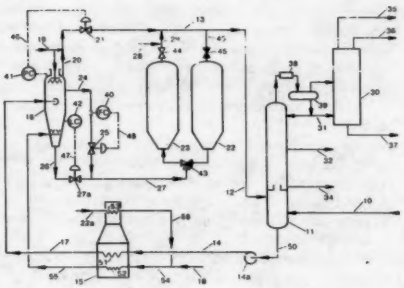
DELAYED COKING PROCESS

Renato M. Mallari, 6403 Teal Run Dr., Houston, Tex. 77035

Continuation of Ser. No. 699,417, Feb. 7, 1985, abandoned. This application Jan. 6, 1986, Ser. No. 816,366

Int. Cl.[4] C10G 9/14

U.S. Cl. 208—131 **12 Claims**



1. In a process for delayed coking of heavy petroleum residue feedstock within a coker heater, a coke drum and a fractionator, wherein the feedstock and recycle material are heated in said heater and then passed to said coke drum to produce coke and overhead vapors, wherein said vapors are fed into a bottom primary section of said fractionator, wherein a heavy gas oil product is fractionated and withdrawn from a secondary section of said fractionator, wherein a light gas oil and other lighter distillates products are fractionated and withdrawn from the succeeding sections of said fractionator, wherein a naphtha and gaseous constituents are fractionated and withdrawn from the top section of said fractionator, wherein a selected portion of said coke drum overhead vapors is condensed as heavy recycle in said primary section of said fractionator and combined with the preheated but unvaporized feedstock, wherein a selected quantity ratio of said heavy recycle and said feedstock is charged to said coker heater, wherein a flow rate of said combined heavy recycle and feedstock is adjusted to operate said coker heater at a selected inlet cold oil velocity, wherein said combined heavy recycle and feedstock is heated to thermal cracking temperature in said coker heater, wherein said temperature is increased further to effect more thermal reactions and additional vaporization of hydrocarbons, wherein a final temperature of the heater effluent is selected to minimize excessive coke deposition in the heater tubes, and wherein said heater effluent of vapor and liquid constituents consists solely of the products of thermal reactions and vaporization of said combined feedstock and heavy recycle at its prevailing pressure and temperature, the improvement comprising:

(a) Feeding and flashing said heater effluent at its prevailing temperature into a flasher drum wherein its vapor and liquid constituents are separated at a selected pressure, and wherein the separated liquid constituent is soaked at a selected residence time to allow further thermal reactions and vaporization in said liquid;

(b) Injecting selected flow rates of heated hydrogen-rich gas and one or more gases selected from the group of steam, light hydrocarbons and refinery fuel gas at a selected temperature into said separated liquid constituent to provide a stripping medium and to provide additional heat for thermal reactions, additional vaporization of hydrocarbons, and minimization of polycyclic aromatic polymerization of bimolecular radicals; all of said heater effluent flashing, said effluent liquid constituent of thermal reactors, and combining of effluent vapor constituent with the vapor products of thermal reactions and vaporization from the liquid therein being performed in said flasher drum to produce a resultant liquid bottoms with more thermally reacted heavy hydrocarbons than said heater effluent liquid; and to produce a resultant vapor with more gaseous constituents, more thermally converted light hydrocarbons, and more vaporized hydrocarbons than said heater effluent vapor;

(c) Injecting a selected flow rate of said resultant vapor at selected flasher drum pressure into the feed line of said coke drum at prevailing coke drum inlet pressure, in order to: (i) reduce the partial pressure of hydrocarbons in the coke drum; (ii) minimize the coke deposition in the coke drum feed line; (iii) control the hardness and quality of the coke product; (iv) control the coke drum overhead vapor temperature;

(d) Flashing to vapor and liquid constituents said resultant liquid bottoms at its prevailing temperature and at prevailing flasher drum pressure into the feed line of said coke drum at prevailing coke drum inlet pressure;

(e) Combining said flashed resultant liquid bottom with said injection vapor in said coke drum feed line at prevailing coke drum inlet pressure;

(f) Feeding said combination of flashed resultant liquid bottoms and injection vapor from the coke drum feed line into said coke drum; and

(g) Removing the remainder of said resultant vapor at its prevailing temperature and at selected flasher drum pressure for further processing.

4,797,198

PROCESS FOR THE WORKING UP OF SALVAGE OIL

Rolf Wetzel, Heiligenhaus; Hubert Coenen, Essen, and Winfried Kreuch, Essen-Heisingen, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 7,358

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1986, 3602586

Int. Cl.[4] C10G 33/00

U.S. Cl. 208—181 **20 Claims**

1. Process for the working up of salvage oil, by subjecting previously dewatered salvage oil to an extraction under supercritical conditions with a solvent which is gaseous at normal conditions and separating extracted components from a separated supercritical gas phase through lowering of pressure or alteration of temperature, comprising

(a) removing solid impurities present in said salvage oil by filtration;

(b) subjecting filtered salvage oil to an atmospheric distillation;

(c) subjecting previously distilled salvage oil to a supercritical extraction, thereby producing a separated supercritical gas phase containing extract components, and separating said extract components from said separated supercritical gas phase in a single step or fractionally;

(d) removing from separated extract components any solvent residue still remaining therein through single or multiple stage relaxation;

(e) subjecting solvent-free extract components to a catalytic hydrogenation, thereby producing a gas stream, and purifying said gas stream by pressurized washing with water or caustic soda;

(f) removing from an extraction residue produced by said extraction any solvent dissolved therein by single or multiple stage relaxation;

(g) eliminating said solvent-free extraction residue through thermal treatment composed of gasifying the solvent-free extraction residue in a flame reaction in the presence of oxygen or air and removing from a gas so produced, composed essentially of CO, H_2, CO_2, H_2O and N_2, any

undesirable components by a subsequently disposed gas purification; and

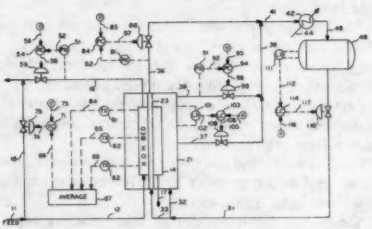
(h) combining solvent recovered from said extraction residue with solvent recovered from said extract components, condensing said solvent and adding said condensed solvent to a main solvent stream which is led back to said extraction stage.

4,797,199

TEMPERATURE CONTROL FOR A KOH TREATER

Joe B. Hampton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 21, 1985, Ser. No. 714,226
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—262.1 6 Claims



1. A method for cooling a KOH treater to which propane containing HF acid is provided as a feed, wherein the reaction of KOH and HF acid in said KOH treater produces heat, wherein propane containing a substantially reduced concentration of HF acid, with respect to the concentration of HF acid in the feed provided to said KOH treater, is withdrawn from said KOH treater and wherein an external jacket surrounds said KOH treater, said method comprising the steps of:

passing a cooling fluid through said external jacket, wherein said cooling fluid passes in heat exchange with the external surface of said KOH treater and withdraws heat caused by the reaction of KOH and HF acid from said KOH treater;

establishing a first signal representative of the desired pressure in said external jacket;

establishing a second signal representative of the actual pressure in said external jacket;

comparing said first signal and said second signal and establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the rate in which vapor should be withdrawn from said external jacket so as to maintain the actual pressure in said external jacket substantially equal to the desired pressure represented by said first signal;

manipulating the withdrawal of vapor from said external jacket in response to said third signal;

establishing a fourth signal representative of the actual liquid level in said external jacket;

establishing a fifth signal representative of the desired liquid level in said external jacket;

comparing said fourth signal and said fifth signal and establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal, wherein said sixth signal is scaled so as to be representative of the rate at which liquid should be withdrawn from said external jacket in order to maintain the actual liquid level in said external jacket substantially equal to the desired liquid level represented by said fifth signal; and

manipulating the withdrawal of liquid from said external jacket in response to said sixth signal.

4,797,200

UPGRADING HEAVY OILS BY SOLVENT DISSOLUTION AND ULTRAFILTRATION

Edward J. Osterhuber, Phillipsburg, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 4, 1984, Ser. No. 606,938
Int. Cl.[4] C10C *3/00*; C10G *21/06*
U.S. Cl. 208—308 10 Claims

1. A method for the separation of a heavy oil comprising aromatic, saturated, polar, and metal-containing hydrocarbons into a permeate fraction enriched in aromatic and saturated hydrocarbons and a retentate fraction enriched in polar and metal-containing hydrocarbons comprising the steps of:

diluting the heavy oil selected from raw crudes, reduced crudes, heavy atmospheric residual oils, heavy vacuum residual oils, hydrorefined crude oils, hydrorefined atmospheric residual oils, shale oil, tar sand products, and coal liquefaction products with a solvent which is completely miscible with the heavy oil in an amount sufficient to completely dissolve the oil so as to produce an ultrafiltration feed;

contacting the ultrafiltration feed with a first side of a continuous generally unswelled organic membrane selected from the group consisting of those comprising cellulose or polyvinylidine fluoride at a pressure between about 750 kPa and about 1500 kPa and at a temperature between 20° C. and about 125° C.;

recovering a permeate fraction enriched in aromatic and saturated hydrocarbons from a second side of the membrane, and

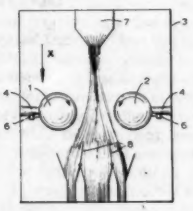
recovering a retentate fraction enriched in polar and metal-containing hydrocarbons from the first side of the membrane.

4,797,201

ELECTROSTATIC FREE-FALL SEPARATOR

Helmuth Küppers, and Hans-Jürgen Knauer, both of Kassel, Fed. Rep. of Germany, assignors to Kali und Salz Aktiengesellschaft, Kassel, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,597
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233528
Int. Cl.[4] B03C *7/12*
U.S. Cl. 209—127.4 6 Claims



1. An electrostatic free-fall separator for separating mixtures of materials having low electrical conductivity, particularly mineral material mixtures, the electrostatic free-fall separator comprising inlet means for feeding a material to be separated; outlet means for withdrawing the material after having been separated and including separating flaps located underneath said inlet means; means for separating the material, located between said inlet means and said outlet means and including at least two rotatable roller-shaped field electrodes arranged parallel to and at a distance from one another and generating a substantially horizontally directed electrical high-voltage field, said roller-shaped field electrodes being formed as cylindrical hollow bodies having a predetermined diameter, two ends formed as semi-spherical caps without edges and of one-piece with a remaining portion of the same hollow body, and hori-

zontally directed longitudinal axes located at the same height parallel to one another, said hollow bodies which form said electrodes being spaced from one another by a relatively small distance which is at most equal to the diameter of said electrodes; and stripping means arranged outside of the electric field generated between said field electrodes.

4,797,202

FROTH FLOTATION METHOD

Richard R. Klimpel, and Robert D. Hansen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 856,728, Apr. 28, 1986, Pat. No. 4,684,459, which is a continuation-in-part of Ser. No. 803,026, Nov. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 787,199, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,890, Sep. 13, 1984, abandoned. This application Feb. 26, 1987, Ser. No. 19,461

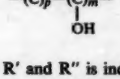
Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 12 Claims

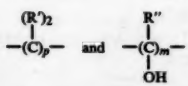
1. A method of recovering metal-containing sulfide minerals, sulfidized metal-containing oxide minerals, precious metal containing minerals, nickel-bearing oxide minerals or copper-bearing oxide minerals from a metal ore which comprises subjecting the metal ore, in the form of an aqueous pulp, to a froth flotation process in the presence of a flotating amount of a flotation collector under conditions such that the metal-containing sulfide mineral, sulfidized metal-containing oxide mineral, precious metal containing mineral, nickel-bearing oxide mineral or copper-bearing oxide mineral is recovered in the froth, wherein the collector comprises a compound corresponding to the formula:

$$R^1—X—(R)_n—N—(R^2)_2$$

wherein $—(R)_n—$ is



each R′ and R″ is independently hydrogen, methyl or ethyl; p+m=n; n is an integer from 1 to 6; m is independently 0 or 1, and p is an integer from 1 to 6 and each



moiety of the $—(R)_n—$ group can occur in random sequence; R^1 is a C_{1-22} hydrocarbyl or a C_{1-22} substituted hydrocarbyl; one R^2 is hydrogen or a C_{1-22} hydrocarbyl and one R^2 is hydrogen, C_{1-22} hydrocarbyl or a C_{1-22} substituted hydrocarbyl; —X— is $N(R^3)—$ or

R^3 is H or a C_{1-22} hydrocarbyl or a C_{1-22} substituted hydrocarbyl and recovering said mineral or minerals from said froth.

4,797,203

REVERSE HYDROCYCLONE CLEANER FOR REMOVING LIGHT CONTAMINANTS FROM PULP SLURRY

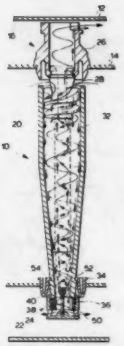
Jacek J. Maclerewicz, Calgary, Canada, assignor to ELP Products Limited, Calgary, Canada

Filed Nov. 19, 1986, Ser. No. 932,251

Claims priority, application United Kingdom, Feb. 22, 1986, 8604462

Int. Cl.[4] B01D *3/00*

U.S. Cl. 209—211 6 Claims



1. A reverse hydrocyclone cleaner for removing light contaminants from pulp slurry, comprising:

a housing defining a hydrocyclone separating chamber,

means for feeding pulp slurry into the separating chamber adjacent an upper end thereof to form an outer helically and downwardly moving slurry stream relatively free from light contaminants, an inner pulp stream containing a substantial amount of said light contaminants and an air core within said inner stream,

an overflow orifice adjacent an upper end of the separating chamber,

an underflow orifice adjacent a lower end of the separating chamber to remove said outer pulp stream relatively free from light contaminants, and

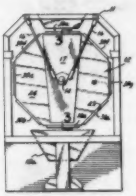
a centrally located blocking finger in the underflow orifice defining a flow passage around which the outer pulp stream passes, said blocking finger having a top portion with a substantially flat upper surface of sufficient diameter to define lower limits of both the air core and the inner pulp stream and cause the inner pulp stream containing a substantial amount of said light contaminants to travel upwardly in the separating chamber in a helical manner around the air core to and through the overflow orifice,

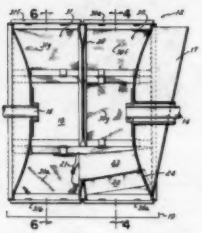
said separating chamber having a conical section adjacent the blocking finger, and said top portion of the blocking finger and said conical section providing therebetween a narrowest portion of said flow passage in the underflow orifice for the outer pulp stream, said top portion having a diameter which is from about 15 to about 25% of the diameter of the separating chamber at entry of the pulp slurry adjacent the upper end thereof and which blocks from about 15 to about 25% of the area of the underflow orifice.

4,797,204
AUTOMATIC PARTICLE-SIZE ANALYZER WITH DIVIDED DRUM

William E. Lower, and Glenn J. Pogue, both of Cincinnati, Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed Mar. 14, 1988, Ser. No. 167,959
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—237 15 Claims





1. In a particle size analyzer of the type having a hollow polygonal drum with a plurality of faces on its periphery with graded screens on different faces thereof, means for rotationally indexing said drum about its longitudinal axis to sequentially position each face in a generally horizontal screening position, and means for applying a screening motion to said drum while in said screening position the improvement comprising:

a. partition means within said drum, said partition means transverse to said longitudinal axis and dividing said drum into first and second screening chambers,

b. said drum having screens of different mesh sizes on the respective faces of said first and second chambers,

c. means for feeding the material to be analyzed into said first chamber,

d. means for transferring said material from said first chamber into said second chamber.

4,797,205
APPARATUS FOR SEPARATING OILY CUTTING LIQUID

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan

Filed Mar. 31, 1987, Ser. No. 32,310
Claims priority, application Japan, Apr. 3, 1986, 61-48964[U]
Int. Cl.[4] B03D *3/00*; B01D *21/06*
U.S. Cl. 210—86 7 Claims

1. An apparatus for separting an oily cutting liquid from a water-soluble cutting liquid, comprising:

a main tank (10) for containing combined liquids (11) including in combination the oily cutting liquid and the water-soluble cutting liquid which constitute two liquid layers;

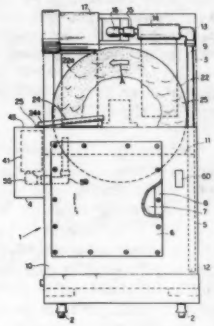
rotation means (22) always immersed at its lower position in the combined cutting liquids (11) for taking out upwardly the oily cutting liquid and some minor amount of water-soluble cutting liquid in a mixed condition from the combined cutting liquids (11) in such a way that the oily cutting liquid is attached onto the rotation means (22) when the rotation means (22) rotates in the combined cutting liquids (22);

means (23, 24) for removing the oily cutting liquid from the rotation means (22);

means (41) for receiving from the removing means (23, 24) the oily cutting liquid mixed with a minority of the water-soluble cutting liquid;

an auxiliary tank (53) for containing only the oily cutting liquid; and

means (48) having first, second and third passages for separating the oily cutting liquid and the water-soluble cutting liquid due to the specific gravity difference between them, the first passage being connected to the receiving means (41) for receiving the mixed liquids from the receiving means (41), the second passage being connected to the main tank (10) for supplying only the water-soluble liquid



into the main tank (10), the third passage being connected to the auxiliary tank (53) for supplying only the oily cutting liquid into the auxiliary tank (53).

7. An apparatus for separating an oily cutting liquid from a water-soluble cutting liquid, comprising:

a main tank (10) for containing combined liquids (11) including in combination the oily cutting liquid and the water-soluble cutting liquid which constitute two liquid layers;

rotation means (22) always immersed at its lower position in the combined cutting liquids (11) for taking out upwardly the oily cutting liquid and some minor water-soluble cutting liquid in a mixed condition from the combined cutting liquids (11) in such a way that the oily cutting liquid is attached onto the rotation means (22) when the rotation means (22) rotates in the combined cutting liquids (22);

means (23, 24) for removing the oily cutting liquid from the rotation means (22); and

a surface sensor (60) for detecting a liquid surface of the combined cutting liquids (11) within the main tank (10) so as to avoid overflow thereof.

4,797,206
SIPHON DEVICE FOR CLEANING SPAS

James P. Lynch, 6901 W. 87th Way, #304, Arvada, Colo. 80003

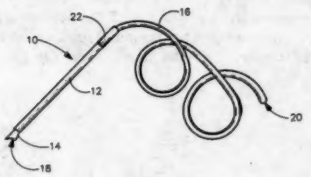
Filed Nov. 6, 1985, Ser. No. 795,362
Int. Cl.[4] E04H *3/20*; F04F *10/02*
U.S. Cl. 210—169 13 Claims

1. A siphon device adapted to remove particulate debris from a spa by utilizing siphoned liquid to convey the debris out of the spa, as the liquid flows to a waste location, comprising:

an elongated, relatively rigid tubular handle having a longitudinal passageway operative to convey liquid from an upstream end to a downstream end thereof;

a nozzle having a surrounding sidewall defining a nozzle

outlet in fluid communication with said passageway at the upstream end of said handle and having an ovoid nozzle inlet formed by a rim of said nozzle at an upstream end thereof, said rim being contiguous on an imaginary concave surface with respect to said nozzle, said nozzle being formed of a pliable material; and



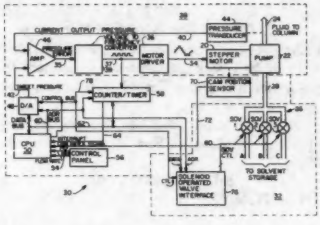
a flexible hose having a hose inlet in fluid communication with said passageway at the downstream end of said handle and having a discharge outlet opposite said hose inlet whereby liquid may flow into said nozzle, through said passageway and said hose and be discharged at said waste location.

4,797,207

APPARATUS FOR CONTROLLING A PUMP TO ACCOUNT FOR COMPRESSIBILITY OF LIQUIDS IN OBTAINING STEADY FLOW

Ronald E. Honganen, Campbell; Robert L. Howe, San Ramon, and Leslie A. Miller, San Jose, all of Calif., assignors to Spectra Physics, Inc., San Jose, Calif.

Filed Sep. 30, 1986, Ser. No. 913,356
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **9 Claims**



1. An apparatus for causing controlled flow of a solvent composition through a liquid chromatography column comprising:

means for pumping a solvent composition comprised of one or more solvents through said column at a constant pressure determined by a pressure control signal including a dual piston pump means for pumping said solvent composition at a pressure determined by said pressure control signal where said dual pistons each have their own cylinder and are driven by the same rotating shaft and an associated drive mechanism such that said pistons have an associated overlap interval in the rotation of said rotating shaft during which both pistons are pushing said solvent composition out their respective cylinders, and where each piston has an intake interval in the rotation of said rotating shaft during which said solvent composition is being drawn by each respective piston into the associated cylinder, said intake interval including a linear interval defined by a constant piston velocity, and further including control means including transducer means for detecting data indicating the actual pressure at the output of said means for pumping, said control means for comparing the actual pressure detected by said transducer means to the desired pressure as determined by said pressure control signal and for controlling the speed of rotation of said rotating shaft during intervals including said overlap interval such that the actual pressure at the output of said means for pumping equals the desired pressure; and

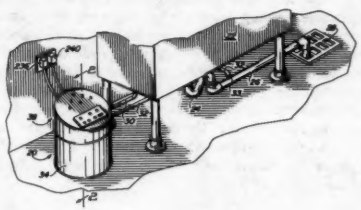
computer means for for receiving data defining the desired flow rate and for determining a correction factor determined by the compressibility of the solvent composition by computing the ratio of the duration of a first interval during which said rotating shaft is moving said pistons through said overlap interval for the current solvent composition and the current actual constant pressure to the duration of a second interval during which said rotating shaft is moving said pistons through said overlap interval for incompressible solvent pumped at a constant pressure, each said first and second intervals being normalized to the time it takes said rotating shaft to rotate through a predetermined angle during which the corresponding one of said pistons moves during the corresponding one of said respective linear intervals, where said predetermined angle is equal to the angle through which said rotating shaft moves while said pistons are in said overlap interval, and said computer means for subtracting one from each said normalized first and second interval before computing said ratio and for multiplying said ratio times a volume factor equal to the amount of volume displaced by one of said pistons during said overlap interval to derive a product and for subtracting said product from said volume factor to derive said correction factor, and for updating said pressure control signal by multiplying the value of the old pressure control signal times the quantity equal to the correction factor plus 1.

4,797,208

AUTOMATIC DRAIN SYSTEM TREATMENT PROCESS

Adam C. Miller, Phoenix; Mitchell M. Hazar, Scottsdale, and William G. Harvey, Glendale, all of Ariz., assignors to Grease Genie, Inc., Phoenix, Ariz.

Filed Nov. 23, 1987, Ser. No. 124,151
Int. Cl.[4] C02F *1/00*
U.S. Cl. 210—606 **4 Claims**



1. A method for automatic cyclic treatment of a drain system comprising the sequential steps of:

(a) energizing a normally closed solenoid valve which is connected to a supply of fresh water under pressure to an open state for directing fresh water into the drain system for a predetermined length of time, and thereafter de-energizing said solenoid valve;

(b) injecting bioactive liquid cultures at a metered flow rate into the drain system for a predetermined length of time subsequent to step (a);

(c) re-energizing said normally closed solenoid valve for again directing fresh water into the drain system for a predetermined length of time, and thereafter de-energizing said solenoid valve

(d) providing a time out period of predetermined duration subsequent to step (b); and

(e) providing a control system including timing devices and

logic circuitry to automatically and sequentially repeat steps (a), (b), (c) and (d) in a cyclic manner.

4,797,209

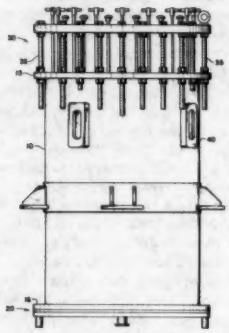
ADJUSTABLE DISTRIBUTION CELL APPARATUS

Derek H. A. Jackson, Tetbury, England, assignor to Amicon Wright Ltd., Gloucestershire, England

Continuation of Ser. No. 881,305, Jul. 2, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 129,926

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—656 **12 Claims**



1. In combination, an adjustable distribution cell apparatus and a chromatography column adapted to receive said apparatus and comprising a column tube, a bed of stationary phase medium and a mobile phase medium, said apparatus comprising:

support means for mounting the apparatus onto the column tube and including means for adjusting the height of the apparatus within the column tube;

second adjustable sealing means suspended from the support means and including a seal-forming element adapted to engage to inside wall of the column tube; and

first adjustable sealing means, disposed between the second adjustable sealing means and the support means, suspended from the support means and including a seal-forming element adapted to engage the inside wall of the column tube, each of said first and second adjustable sealing means being independently adjustable between a first position, wherein said seal-forming element does not engage the inside wall of the column in a fluid-tight manner, and a second position wherein said seal-forming element engages the inside wall of the column in a fluid-tight manner.

4,797,210

AUTOMATICALLY CONTROLLED WATER BUOYANT POLLUTION-SKIMMER-AND-RECOVERY SYSTEM

Vincent P. Lonardo, 2642 Salt Springs Rd., Girard, Ohio 44420

Filed Apr. 17, 1987, Ser. No. 39,213

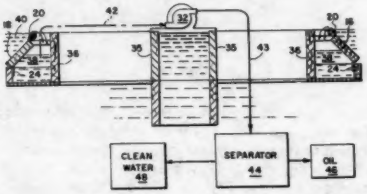
Int. Cl.[4] E02B *15/04*

U.S. Cl. 210—242.3 **7 Claims**

1. A system for recovering water-light pollutants immiscible with water from the surface of contaminated water, said system which comprises in combination:

(A) a hull submersible in water to be processed, said hull having an opening along the bottom thereof which is in open contact with the water to be processed and for permitting water entry into the central portion of the hull such that the entire hull will be substantially submerged when disposed in water to be processed, said hull having a vertically disposed frame defining an inner surface of a moat which extends about the perimeter of the hull, said moat having side members which are disposed oppositely to said vertically disposed frame and extending about the perimeter of the hull, said side members being joined to inwardly tapered base members which define said opening at an edge opposite the side members;

(B) pivotal weir members disposed oppositely to the vertically disposed frame and extending about the perimeter of the moat, said pivotal weir members joined by a flexible membrane to the top surface of the side members, said pivotal weir members configurated for limiting water and pollutants entry into the moat when the pivotal weir



members are pivoted away from the vertically disposed frame and to the upright position, said pivotal weir members configurated for providing a cascade of water and pollutants into the moat when the pivotal weir members are pivoted toward the vertically disposed frame and to a lowered position, said pivotal weir members being raised to the upright position and lowered to the lowered position by buoyant means and the weight of water and contaminants in the moat; and

(C) a pump for withdrawing pollutants and water from the moat.

4,797,211

CROSS FLOW MICROFILTER

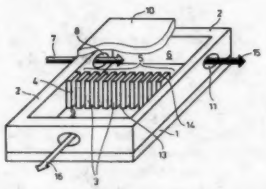
Wolfgang Ehrfeld, Karlsruhe, and Dietrich Münchmeyer, Stutensee, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 24, 1986, Ser. No. 945,882

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546091

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.84 **7 Claims**



1. In a cross flow microfilter comprising a filter housing having a flow chamber wherein a fluid is introduced through at least one inlet and a concentrate is removed through at least one outlet on the side opposite the inlet, a collection chamber from which a filtrate is removed, and at least one microporous membrane disposed between the flow chamber and the collection chamber, said membrane having an inlet surface along which the fluid to be filtered flows, an outlet surface oriented toward the collection chamber and pores of a width between about 0.1 micron and 30 microns, the improvement wherein said membrane comprises a plurality of webs disposed in at least one row and spaced at a predetermined distance from

one another to define openings having slit-shaped cross-sections said openings having uniform and predetermined widths and given profiles and constituting said pores;

said microfilter further comprises two terminating plates enclosing said webs and laterally bounding said openings; and

said webs are formed on one of said plates by one of X-ray lithography, X-ray depth lithographic-galvanoplasty molding, and molding with subsequent galvanoplasty.

4,797,212

BIOLOGICAL PURIFICATION OF WASTE WATERS

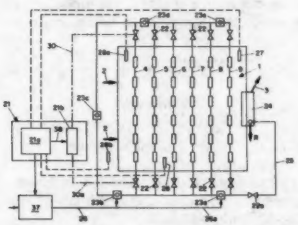
Reinhart von Nordenskjöld, Am Jadweg 4, 8011 Solalinden, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,479

Claims priority, application European Pat. Off., Jun. 13, 1986, 3619954.0

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—614 18 Claims



1. A process for the biological purification of water in a basin having a plurality of aerator chains installed in generally parallel spaced-apart relation across the basin, the aerator chains each including a plurality of bottom aerators located close to the basin floor, the aerator chains being supported so as to move in a reciprocating way during operation so that the bottom aerators periodically move over the basin floor to mix sludge with the water, comprising supplying air sufficient for aeration and mixing of the sludge and waste water in the adjacent portion of the basin to one or more selected aerator chains while supplying less or no air to other aerator chains so that mixing of water and sludge takes place in the portions of the basin adjacent to the selected aerator chains, and periodically changing the selected aerator chains in a progressive manner through the basin to provide one or more zones which move through the basin in wave-like fashion in which mixing of sludge and water occurs.

12. A water treatment facility comprising a basin through which water flows in one direction during treatment, a plurality of aerator chains extending in generally parallel spaced-apart relation across the basin, a plurality of bottom aerators included in each aerator chain at locations adjacent to the bottom of the basin, the bottom aerators and the aerator chains being arranged to move with respect to the bottom of the basin when the aerator chain is fully aerated to mix sludge with the water and supply air to the water, air supply means, and control means for controlling the supply of air from the air supply means to each of the aerator chains selectively and causing spaced aerator chains in the plurality to be fully aerated and at least one aerator chain between the spaced chains to receive less or no air and for periodically changing the aerator chains which are fully aerated in a progressive manner along the length of the basin to produce aerated zones which move in a wave-like fashion through the basin.

4,797,213

SEPARATION OF ISLETS OF LANGERHANS

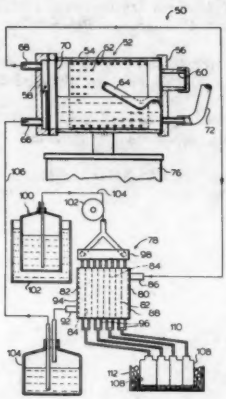
John W. Parisius, 205 Maplehurst Avenue, Willowdale, Ontario, Canada M2N 3C3, and Anthony M. Sun, 4 Barkwood Crescent, Willowdale, Ontario, Canada M2H 3G6

Filed Feb. 24, 1987, Ser. No. 17,844

Claims priority, application United Kingdom, Feb. 24, 1986, 8604497

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 9 Claims



1. A method for the separation of Islets of Langerhans from pancreatic tissue, which comprises:

treating pancreatic tissue to release Islets from other pancreatic tissue to provide an aqueous suspension of Islets and pancreatic tissue debris;

removing said pancreatic tissue debris from said aqueous suspension by filtering off said pancreatic tissue debris and leaving an aqueous suspension of Islets,

removing said Islets from said aqueous suspension by passing said aqueous suspension of Islets successively through a series of screens of decreasing pore size in the direction of flow of said suspension of Islets so as to remove said Islets from said aqueous suspension of Islets on the surface of said screens, and

recovering the Islets from each of said screen surfaces by passing an aqueous wash medium across the surface of each of the screens to remove said Islets from said screen surfaces as an aqueous suspension thereof in said aqueous wash medium.

4,797,214

METHOD OF TREATMENT OF WASTE STREAMS OF OIL/WATER EMULSIONS OR SOLUTIONS

David C. Sevier, Branford, Conn., assignor to Vincent Saputo; Lorraine Saputo, both of Branford; Charles Blaha, Killingworth; Paul Orsino, East Haven and Accu-Lab, Inc., Branford, all of, Conn., part interest to each

Filed Jul. 7, 1987, Ser. No. 70,869

Int. Cl.[4] B01D *17/05*

U.S. Cl. 210—651 5 Claims

1. A process for treating an emulsion or solution of water and oil comprising the steps of:

(a) contacting said emulsion or solution with sodium chloride in an amount of at least 140 g/l of emulsion or solution;

(b) contacting said emulsion or solution with a synthetic anionic polyelectrolyte flocculant having a molecular weight of about six to eight million and a charge of 3 in an amount of at least 0.5 ml/l of emulsion or solution; and

(c) after steps (a) and (b), contacting said emulsion or solution with a demulsifying agent comprising sulfuric acid in an amount of at least 5 ml/l of emulsion or solution to split said emulsion or solution into separate oil and water phases for subsequent separation.

4,797,215

METHOD FOR SEQUENTIAL CENTRIFUGAL STRATIFICATION CHROMATOGRAPHY FOR SEPARATING COMPONENTS FROM MIXTURES

Szabolcs Nyiredy; Clemens Erdelmeier, and Otto Sticher, all of Zurich, Switzerland, assignors to Petazon, Inc., Zug, Switzerland

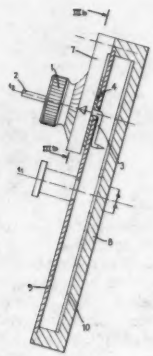
PCT No. PCT/CH85/00054, § 371 Date Feb. 4, 1986, § 102(e) Date Feb. 4, 1986, PCT Pub. No. WO85/04594, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 3, 1985, Ser. No. 842,703

Claims priority, application Switzerland, Apr. 5, 1984, 1717/84

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—658 **12 Claims**



1. A method for separating complonents of a mixture by a sequential centrifugal stratification chromatographic technique utilizing a rotatably supported rotor which includes an adsorbing medium, comprising the steps of:

(a) applying the mixture which is to be separated to a radially inner part of said adsorbing medium on said rotatable rotor;

(b) separating the mixture by rotating said rotor and by applying to a radially inner part of said adsorbing medium on said rotating rotor a first eluent which effects different amounts of radially outward migration of the components of the mixture through said adsorbing medium on said rotor through the action of centrifugal force;

(c) thereafter stopping said migration of the components of the mixture;

(d) thereafter applying a second eluent to a circular region of said adsorbing medium which is concentric to the axis of rotation of said rotor and which has a radius within a range bounded by said radially inner part and a radially outer edge portion of said adsorbing medium, said second eluent causing at least one of the components of the mixture which is near said circular region of said adsorbing medium to migrate radially through said adsorbing medium through capillary action;

(e) thereafter interrupting the application of eluent to said adsorbing medium;

(f) thereafter drying said adsorbing medium;

(g) thereafter rotating said rotor and applying a third eluent to a circular region of said adsorbing medium which is concentric to the axis of rotation of said rotor, said third eluent causing at least one of the components of the mixture to migrate radially outwardly through said adsorbing medium through the action of centrifugal force and to be eluted from a radially outer edge of said adsorbing medium; and

(h) collecting and discharging each component which is eluted from said radially outer edge of said adsorbing medium on said rotating rotor.

4,797,216

DELAYED CROSSLINKER COMPOSITION

Richard M. Hodge, Sand Springs, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Division of Ser. No. 831,229, Feb. 19, 1986, Pat. No. 4,657,081. This application Nov. 17, 1986, Ser. No. 931,772

Int. Cl.[4] E21B *43/26*

U.S. Cl. 252—8.551 **13 Claims**

1. A crosslinker composition that can produce delayed crosslinking of an aqueous solution of a crosslinkable organic polymer, consisting essentially of about 1% to about 10% by weight of an organic zirconium complex and about 2% to about 37% by weight organic hydroxycarboxylic acid selected from the group consisting of lactic, mandelic and hydroxyacetic acids the pH of the composition being no greater than 4.8.

4,797,217

OVERBASED ADDITIVES

John A. Cleverley, Didcot, United Kingdom, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 12, 1986, Ser. No. 895,839

Claims priority, application United Kingdom, Aug. 13, 1985, 8520254; Jan. 18, 1986, 8601193

Int. Cl.[4] C10M *135/10*

U.S. Cl. 252—42.7 **9 Claims**

1. A process for preparing an oil solution of a highly basic lithium sulphonate having a TBN of at least 250 mg(KOH)/gm, which comprises:

(i) heating lithium monohydrate with a solvent to remove water as an azeotrope of water and said solvent, without formation of any substantial amount of lithium alkoxide, and to form a mixture comprising substantially dehydrated basic lithium compounds in the remaining solvent;

(ii) adding to the mixture an alkoxyalkanol and an organic sulphonic acid so as to convert a part of the basic lithium compounds to the lithium salt of the sulphonic acid;

(iii) thereafter introducing carbon dioxide into the mixture so as to react with the residual basic lithium compounds;

(iv) removing solvent by distillation; and

(v) adding base oil to the process during one or more of steps (ii), (iii) and (iv) so that the desired product is obtained.

4,797,218

STABILIZER THIIRANE DERIVATIVES CONTAINING HINDERED PHENOL GROUPS

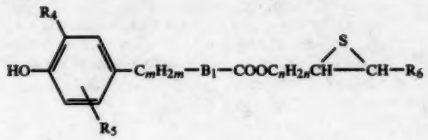
David H. Steinberg, New York, and Frank Cortolano, Valhalla, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 836,361, Mar. 5, 1986, abandoned, which is a division of Ser. No. 773,723, Sep. 9, 1985, Pat. No. 4,617,404. This application Aug. 18, 1986, Ser. No. 898,815

Int. Cl.[4] C10M *105/08*; C09K *15/08, 15/10*; C07D *327/02*

U.S. Cl. 252—47.5 **2 Claims**

2. A method for stabilizing a lubricating oil against oxidative, thermal and actinic degradation which comprises incorporating into said lubricating oil an effective stabilizing amount of a compound of the formula



wherein R_4 and R_5, independently, denote alkyl with 1 to 6 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, allyl, methallyl, aralkyl with 5 to 9 carbon atoms, R_5 moreover also denotes hydrogen, m is an integer from 0 to 6, n is an integer from 1 to 6, B_1 denote —O—, —S— or —NH—, the group —OC(O)—, —OC(O)—CH_2—CH_2— or a direct bond, and R_6, when B_1 is a direct bond, denotes hydrogen, alkyl with 1 to 6 carbon atoms, unsubstituted phenyl or phenyl substituted by chlorine, methyl or chlorine and methyl.

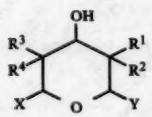
4,797,219

NOVEL DISPERSANTS FOR OLEAGINOUS COMPOSITIONS

Antonio Guttierrez, Mercerville, and Jack Ryer, East Brunswick, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 24, 1987, Ser. No. 41,983
Int. Cl.[4] C10M *129/72, 129/74*
U.S. Cl. 252—56 D **24 Claims**

1. An adduct formed by reacting at least one long chain hydrocarbyl polymer substituted mono- or polycarboxylic acid acylating reagent and at least one heterocyclic polyol of the formula:



wherein R^1, R^2, R^3 and R^4 are the same or different and are selected from the group consisting of H, alkyl and —CH(OH)R^5, wherein R^5 is hydrogen or alkyl of from 1 to 10 carbon atoms and X and Y are the same or different and are H or alkyl of from 1 to 10 carbon atoms, with the proviso that at least one of R^1, R^2, R^3 and R^4 is the —CH(OH)R^5 moiety, wherein said long chain hydrocarbon polymer has a number average molecular weight of from about 700 to about 5000.

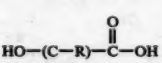
4,797,220

DESCALING AND ANTI-OXIDIZING COMPOSITION AND PROCESS THEREFOR

Dale A. Miller, 110 W. Missouri, #26, Phoenix, Ariz. 85013

Filed Feb. 3, 1988, Ser. No. 151,712
Int. Cl.[4] C11D *7/32*
U.S. Cl. 252—82 **22 Claims**

1. A chemical composition comprising:
(a) a hydroxycarboxylic acid having the formula

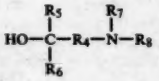


(I)

wherein R is hydrogen, a branched or straight chain alkyl, cycloalkyl or aryl substituent having one or more carbon atoms and which does not inactivate the carboxylic acid group;
(b) an alcohol having the formula

(II)

wherein R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, a branched or straight chain alkyl group, a cycloalkyl group or an aryl group; and
(c) an alkanolamine having the formula



(III)

wherein R_4 is an branched or straight chain alkyl group having from 0–5 carbon atoms, and R_5, R_6, R_7 and R_8 are selected from the group consisting of hydrogen, a branched or straight chain alkyl group, a cycloalkyl group or aryl group.

4,797,221

POLYMER SHEET FOR DELIVERING LAUNDRY CARE ADDITIVE AND LAUNDRY CARE PRODUCT FORMED FROM SAME

Thomas D. Gueldenzopf, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 775,298, Sep. 12, 1985, abandoned. This application May 9, 1988, Ser. No. 193,205
Int. Cl.[4] A62D *3/00, 9/00;* C01B *7/00;* C09K *3/00*
U.S. Cl. 252—95 **22 Claims**

1. A water-soluble sheet for delivering laundry care additives containing bleaches, which sheet comprises a self-supporting water-soluble film of an addition polymer formed of:
(a) from about 0 to 85% by weight of a water-insoluble soft monomer;
(b) from about 15 to 60% by weight of a water-soluble anionic monomer;
(c) from about 0 to 25% by weight of a water-soluble non-ionic monomer; and
(d) from about 0 to 40% by weight of a water-insoluble hard monomer,
wherein said addition polymer is up to about 100% neutralized with a Group IA metal base or a Group IA metal basic salt.

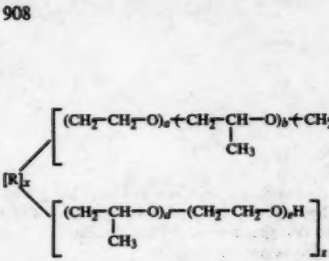
4,797,222

FOAM INHIBITOR MIXTURE

Rainer Hoefer, Duesseldorf; Karl H. Schmid, Mettmann; Adolf Asbeck, Duesseldorf, and Uwe Held, Velbert, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 39,050
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613128
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] C11D *1/72;* B01D *19/04*
U.S. Cl. 252—174.21 **10 Claims**

1. A foam inhibitor mixture comprising:
(a) a foam inhibiting quantity of a block polymer of the formula:



(I)

in which R represents a glycerol residue (x=1), a trimethylol ethane residue (x=1) or trimethylol propane residue (x=1) or a polyglycerol residue having a degree of polymerization x of from 2 to 6, and the indices $y=(x-z+2)$, $z=(x-y+2)$, a=1 to 15, b=50 to 250, c=1 to 15, d=50 to 250 and e=1 to 15, with the proviso that the sums $(a+c+e)=2$ to 20, $(b+d)=50$ to 250 and $(c+e)=1$ to 15 and y has a value of at least 1, and

(b) a minor quantity of an emulsifier of the formula:

$$R^1—O—(CH_2CH_2—O)_n—R^2 \quad \text{(II)}$$

in which R^1 is a linear or branched C_8–C_{20} alkyl or alkenyl radical or a C_{12}–C_{20} aromatic alkyl radical, R^2 is a C_3–C_8 alkyl radical and n is a number of from 4 to 30.

4,797,223

WATER SOLUBLE POLYMERS FOR DETERGENT COMPOSITIONS

David R. Amick, Doylestown; Charles E. Jones, Yardley, and Kathleen A. Hughes, Blue Bell, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 11, 1988, Ser. No. 142,751
Int. Cl.[4] C11D 3/37
U.S. Cl. 252—174.23 **16 Claims**

1. A detergent composition containing a surfactant selected from the group consisting of anionic, nonionic, and cationic surfactants and mixtures thereof and including a water soluble polymer, the water soluble polymer being selected from

(a) polymers of acrylic and methacrylic acid esters of an alkyl polyalkylene oxide, alkylpolyalkylene oxide of urethanes or containing alkylpolyalkylene oxide thio end groups, said polymers having the formula

$$A\ (B)_m\ (C)_n\ (D)_o\ E,$$

(1) A being a group selected from

$$R^b—C(O)—R^a— \text{ and } R^c—C(O)NH—R^d—;$$

R^a being selected from (C_2–C_5)alkylidene and (C_2–C_5)alkylidene derivatives including a chain initiator or chain transfer radical;

R^b being selected from —OQ and R^c;

R^c having the formula

$$R^1\ Z\ (X^1)_a\ (X^2)_b—;$$

R^1 being selected from (C_1–C_{18})alkyl, (C_1–C_{18})alkaryl, and (C_1–C_{18})aralkyl;

Z being selected from —O—, —S—, $—CO_2—$, $—CONR^2—$, and $—NR^2—$;

X^1 being $—CH_2CH_2O—$;

X^2 being $—C(CH_3)HCH_2O—$;

a being a positive integer and b being a non-negative integer, the sum of a and b being from 3 to about 100, it being understood that the X^1 and X^2 units can be arranged in any sequence;

R^2 being selected from H, (C_1–C_4)alkyl, and $H(X^1)_d(X^2)_e—$; d and e being nonnegative integers, the sum of d and e being from 1 to about 100;

Q being selected from H and the positive ions forming soluble salts with carboxylate anions;

R^d being a group which includes a carbon-carbon single bond formed during polymerization of the polymer from a polymerizable carbon-carbon double bond;

(2) B having the formula

$$—\overset{|}{R^e}—C(O)—OQ,$$

R^e being a saturated trivalent aliphatic group having from two to five carbon atoms

(3) C being selected from

$$—\overset{|}{R^e}—R^c, \quad —\overset{|}{R^f}—NHC(O)—R^c \text{ and } —\overset{|}{R^e}—C(O)—R^c,$$

R^f being a group which includes a carbon-carbon single bond formed during polymerization of the polymer from a polymerizable carbon-carbon double bond;

(4) D having the formula

$$—\overset{|}{R^e}—G$$

wherein G is an organic group excluding Rc and $—CO_2Q$;

(5) E being a group selected from

$$R^c—R^g—, \ R^b—C(O)—R^g— \text{ and}$$
$$R^c—C(O)NH—R^d—,$$

R^g being selected from (C_2–C_5)alkylene and (C_2–C_5) alkylene derivatives including a chain transfer radical;

m being a positive integer and n and o being non-negative integers, m being selected such that $(B)_m$ comprises from about 20 to percent by weight of the polymer, n being selected such that R^c comprises from about 80 to 5 percent by weight of the polymer, o being selected such that $(D)_o$ comprises from zero up to about 30 percent by weight of the polymer, the sum of the weight percentages of A, $(B)_m$, $(C)_n$, $(D)_o$ and E being 100 percent, it being further understood that the B, C, and D groups can be arranged in any sequence; and the polymer having a number-average molecular weight from about 500 to 50,000; and

(b) polymers having the formula L-J,

L— having the formula $R^c—C(O)(CHR^3)_c—S—$,

—J having the formula—$(B)_m(D)_oE$,

the subscript c being selected from 1, 2, and 3,

R^3 being selected from H—, $CH_3—$, and $C_2H_5—$,

the weight ratio of L to J being from about 1:340 to 7:1,

o being selected such the $(D)_o$ comprises up to about 40 percent by weight of the polymer, and

the sum of m and n being from about 10 to 500.

4,797,224

BRANCHED ALKYL ACRYLAMIDE TYPES OF POLYMER-ZINC CORROSION INHIBITOR

Guy A. Crucil, Bloomingdale, and Laura J. Blaser, Western Springs, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 848,014, Apr. 3, 1986, abandoned. This application Sep. 2, 1987, Ser. No. 92,008
Int. Cl.[4] C02F 5/14
U.S. Cl. 252—181 **5 Claims**

1. A composition for preventing corrosion and scale in aqueous recirculating systems which consists essentially of an aqueous solution having a pH within the range 2.0–13.5 and containing at least 2 ppm of 2-phosphono-butane-1,2,4 - tricarboxylic acid, or its water-soluble salts and containing a water-soluble zinc-polymer complex having a zinc:polymer weight ratio with the range 1:3 to about 1:20 and having also dissolved

therein a water-soluble orthophosphate ion source that the zinc:orthophosphate ion weight ratio is between about 1:1 to about 1:5, and wherein the polymer is a nitrogen-containing zinc-complexing polymer having a molecular weight between about 2500–25,000 and is chosen from the group consisting of water-soluble terpolymers containing from 20–80 percent by weight acrylic acid, or its water-soluble salts, 10–40 weight percent methacrylic acid, or its water-soluble salts, and at least two (2) weight percent of an N-alkylated acrylamide monomer, wherein the nitrogen substituted alkyl group contains from 3–12 carbon atoms and wherein the nitrogen substituted alkyl group is branched.

4,797,225

NONAQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMPOSITION CONTAINING AN ALKALI METAL DITHIONITE OR SULFITE REDUCTION BLEACHING AGENT AND METHOD OF USE

Guy Broze, Grace-Hollogne, and Danielle Bastin, Soumagne, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,327
Int. Cl.[4] C11D *7/54*; D06L *3/00*
U.S. Cl. 252—105 **21 Claims**

1. A nonaqueous liquid heavy duty built laundry detergent composition which comprises 20 to 50 percent of a nonionic liquid surfactant detergent, 15 to 50 percent of a detergent builder and 2 to 25 percent of a reduction bleaching agent which is a member selected from the group of alkali metal dithionite and alkali metal sulfite.

4,797,226

LOW TEMPERATURE, COMPATIBLE MIXTURES OF POLYETHER PREPOLYMERS AND FLOW MODIFIERS

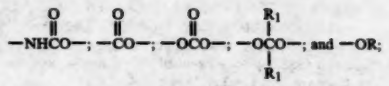
Fritz Hostettler, 200 Springhill Rd., Skillman, N.J. 08558

Continuation of Ser. No. 779,312, Sep. 24, 1985, abandoned, which is a continuation of Ser. No. 508,192, Jun. 27, 1983, abandoned. This application May 5, 1987, Ser. No. 48,455
Int. Cl.[4] C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182.2 **31 Claims**

1. A stable, compatible liquid mixture which does not phase separate when stored for several days at temperatures substantially below normal room temperature consisting essentially of:

(a) an isocyanato-containing prepolymer obtained from the reaction of (i) a diphenylmethane diisocyanate and (ii) linear or slightly branched polyetherpolyols having hydroxyl equivalent weights of from about 60 to about 2250 and an average hydroxyl functionality of from 2 to about 3, said diisocyanate and said polyetherpolyol being used in such quantities so as to provide at least about 2.5 NCO equivalents per OH equivalent, and

(b) from about 3 to about 35 parts by weight, per 100 parts by weight of said prepolymer, of a non-hydroxyl flow modifier, said flow modifier having the following characteristics: (i) a boiling point above about 150° C., (ii) normally-liquid at 20° C. or relatively low melting solid which forms a compatible liquid mixture with said prepolymer, (iii) an average molecular weight of from about 100 to approximately 3000, and (iv) consisting essentially of carbon and hydrogen atoms in the form of monovalent or polyvalent hydrocarbon groups or mixtures of such groups; etheric oxygen in the form of oxyalkylene, all terminal oxyalkylene groups being satisfied by acyclic, alicyclic or aromatic groups which are monovalently bonded to the oxy moiety of the terminal oxyalkylene groups; and at least one group having the following structural configuration;



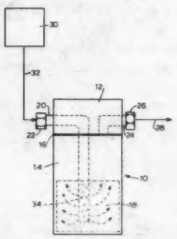
each R_1, individually, being hydrogen or a monovalent hydrocarbon group, and R being a hydrocarbyl group; and wherein each of the unsatisfied bonds of the above structural units are monovalently bonded to separate carbon atoms of the flow modifier molecule, said flow modifier being further characterized by the absence of groups which are normally reactive with an isocyanato group.

4,797,227

PROCESS AND COMPOSITION FOR PURIFYING HYDROGEN SELENIDE AND HYDROGEN TELLURIDE, TO REMOVE MOISTURE AND OXIDANT IMPURITIES THEREFROM

Glenn M. Tom, New Milford, and Duncan W. Brown, Wilton, both of Conn., assignors to Advanced Technology Materials Inc., New Milford, Conn.

Filed Jul. 31, 1987, Ser. No. 80,478
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—194 **17 Claims**



1. A scavenger, having utility for purifying a mixture comprising

(i) a primary component selected from one or more members of the group consisting of hydrogen selenide and hydrogen telluride, and

(ii) impurities selected from one or more members of the group consisting of moisture and oxidants, said scavenger comprising

(a) a support, and

(b) associated with said support, one or more members of the group consisting of compounds of the formula $R_{3-x}AlH_x$, wherein x is 0 or 1, and R is a hydrocarbon radical containing from 1 to 12 carbon atoms.

10. A scavenger, having utility for purifying a mixture comprising

(i) a primary component selected from one or more members of the group consisting of hydrogen selenide and hydrogen telluride, and

(ii) impurities selected from one or more members of the group consisting of moisture and oxidants, said scavenger comprising

(a) a macroreticulate polymer support, and

(b) associated with the support, but not covalently bonded thereto, aluminum chalconides of tellurium and/or selenium.

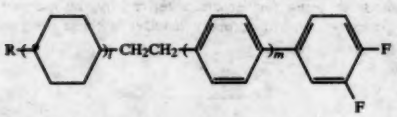
4,797,228

CYCLOHEXANE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Yasuyuki Goto, Yokohamashi; Shigeru Sugimori, Fujisawashi, and Tetsuya Ogawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 28, 1986, Ser. No. 867,680
Claims priority, application Japan, Jun. 10, 1985, 60-125489
Int. Cl.[4] G02F 1/13; C09K 19/30; C07C 19/08, 21/24, 25/13
U.S. Cl. 252—299.63 5 Claims

1. A cyclohexane derivative expressed by the formula



wherein R is an alkyl group of 1 to 10 carbon atoms; l is 1 or 2; m is 0 or 1; with the proviso that the sum of l and m is 1 or 2.

4,797,229

FUNCTIONAL FLUIDS CONTAINING ASSOCIATIVE POLYETHER THICKENERS, CERTAIN DIALKYL-DITHIOPHOSPHATES, AND A COMPOUND WHICH IS A SOURCE OF MOLYBDATE ION

Mark A. Frentrup, Dearborn; Joseph R. Gibson, Riverview; James E. Carson, Lincoln Park, and Pauls Davis, Gibraltar, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 6, 1984, Ser. No. 678,963
Int. Cl.[4] B01D 17/04; C10M 125/22
U.S. Cl. 252—345 8 Claims

1. A functional fluid which comprises

(a) a dialkyldithiophosphate having the following structural formula:

wherein R is individually a linear or branched alkyl, alkenyl, aryl, arylalkyl, or alkylaryl groups having from 1 to 24 carbon atoms;

(b) from 0.2 part to 3.0 parts by weight of a compound which is a soure of molybdate ion;

(c) from 0.5 part to 10.0 parts by weight of a polyether nonionic surfactant; and

(d) from 0.01 part to 20.0 parts by weight of an associative polyether thickeners, said weight of components (a), (b), (c), and (d) based upon 1.0 part by weight of the dialkyldithiophosphate; and

(e) a diluent in an amount such that from about 60 to about 99 percent of the fluid is water, or a mixture of water and a freezing point lowering additive.

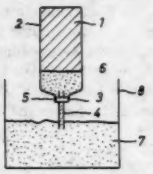
4,797,230

METHOD OF DISSOLVING SOLID OR SEMI-SOLID MATERIAL INTO SOLVENT

Kiyoshi Yamamoto; Toshihiro Nakamura; Tadao Ito, and Kelichiro Inui, all of Osaka, Japan, assignors to Shinto Paint Co. Ltd., Amagasaki, Japan

Filed May 28, 1986, Ser. No. 867,836
Claims priority, application Japan, Jun. 24, 1985, 137132
Int. Cl.[4] B01F 1/00, 3/12; B01J 8/02; B08B 3/04
U.S. Cl. 252—364 4 Claims

1. A method of dissolving a solid or semi-solid material which has formed a hard mass in a container equipped with a takeout opening or takeout openings in communication with a solvent in another container, comprising contacting the solvent and the solute by positioning the container of one of said solute or said solvent which has the larger specific gravity above the container of the other which has the smaller specific



gravity, whereby dissolution of the solute in the solvent forms a solution having a different specific gravity than the solvent which creates convection currents drawing the heavier material down and the lighter material up.

4,797,231

MULTIPURPOSE CLEANING PREPARATIONS FOR HARD SURFACES

Klaus Schumann, Erkrath; Ortburg Guirr, Krefeld; Paul Schulz, Wuppertal, and Franz Foerg, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 851,636, Apr. 14, 1986, abandoned.
This application Feb. 5, 1988, Ser. No. 150,464
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3514019; Jan. 22, 1986, 3601798
Int. Cl.[4] C11D 1/18, 1/12
U.S. Cl. 252—547 15 Claims

1. A builder-free aqueous, liquid, suspension-stable multipurpose cleaning composition consisting essentially of:

A. from about 10 to about 35% by weight, based on the weight of the cleaning composition, of a mixture of at least two of the following:

(a) at least one anionic sulfonate surfactant,

(b) at least one anionic sulfate surfactant, and

(c) at least one amphoteric surfactant, wherein when the mixture consists of a mixture of (a) and (b), from about 5 to about 95% by weight of (a) and correspondingly from about 95 to about 5% by weight of (b) is present, based on the weight of the mixture, and when the mixture consists of (c) and either one or both of (a) and (b), then (c) is present in from about 0.5 to about 15% by weight, based on the weight of the cleaning composition, provided that when (c) is present the ratio by weight of (a) or (b) or (a)+(b) to (c) is from about 20:1 to about 1:1;

B. from about 5 to about 20% by weight, based on the weight of the cleaning composition, of at least one abrasive having a particle diameter of from about 5 to about 15 μm;

C. at least one viscosity regulator in amount sufficient to regulate the viscosity of the cleaning composition to from about 4,000 to about 6,000 mPas;

D. from 0.3 to about 1% by weight based on the weight of the cleaning composition, of fat solvent selected from a terpene hydrocarbon, a terpene alcohol, and a glycol ether having a molecular weight of greater than about 200,000 to about 4,000,000;

E. a pH regulator in amount sufficient to provide a pH in the range of from about 5.5 to about 9.5 for the cleaning composition; and

F. the remainder, water.

4,797,232

PROCESS FOR THE PREPARATION OF A BOROSILICATE GLASS CONTAINING NUCLEAR WASTE

Bruno Aubert, Marignan, France, assignor to Societe Generale pour les Techniques Nouvelles, Paris, France

Filed Apr. 6, 1987, Ser. No. 35,051
Claims priority, application France, Apr. 8, 1986, 86 05010
Int. Cl.[4] G21F 9/16, 9/14
U.S. Cl. 252—629 21 Claims

13. A process for immobilizing nuclear waste in the form of a liquid aqueous solution as a waste material, the process comprising the steps of:

A. simultaneously mixing glass-forming materials in an aqueous system, the ingredients comprising:
   1. a silica gel precursor for forming silica in the final glass, the precursor being an aqueous suspension of colloidal silica;
   2. a boron compound in an aqueous solution for forming boron oxide in the final glass; and
   3. an aqueous solution of vitrification adjuvant, the mixing being done at an acid pH and a temperature of about 20° to 80° C. to provide a gel solidified material;

B. drying the resultant solidified material to provide a dried gel;

C. calcining the dried gel of Step B at a temperature of about 300° to 500° C.;

D. melting the calcined product of Step C to form a melted glass;

E. solidifying the melted glass to form a borosilicate glass that encapsulates a nuclear waste material; and

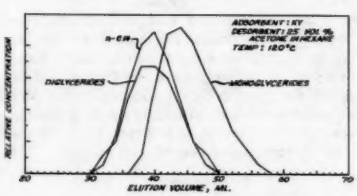
F. adding an aqueous solution of nuclear waste or a calcinate of the aqueous solution of the nuclear waste to the dried material of step B or the calcined product of step C or the melted product of step D to provide the immobilized waste product.

4,797,233

PROCESS FOR SEPARATING MONO-, DI-AND TRIGLYCERIDES

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 20, 1986, Ser. No. 898,300
Int. Cl.[4] C11C 1/08
U.S. Cl. 260—428.5 10 Claims



1. A continuous process separating monoglycerides from a mixture comprising monoglycerides and diglycerides said process comprising contacting said mixture at adsoprtion conditions with an adsorbent selected from the group consisting of an X type zeolite exchanged with Na, Mg, Li or K at exchangeable sites, a Y type zeolite exchanged with potassium or sodium at exchangeable sites, and an L type zeolite exchanged with potassium, thereby selectively adsorbing said monoglycerides thereon and desorbing said monoglycerides at desorption conditions and eluting said diglycerides with a desorbent selected from the group consisting of ketones having up to 7 carbon atoms and mixtures thereof with paraffin hydrocarbons.

4,797,234

PRODUCTION OF SUSTAINED RELEASE COMPOSITION FROM SALT-FORM REACTANTS

Tully J. Speaker; Tycho J. Speaker, both of Philadelphia, Pa., and John H. Collett, Sale, England, assignors to Temple University, Philadelphia, Pa.

Filed Jun. 19, 1987, Ser. No. 64,859
Int. Cl.[4] A61K 9/50, 9/62, 9/66; B01J 13/02
U.S. Cl. 264—4.1 7 Claims

1. A method for producing a microcapsule comprising an anisotropic salt film for the gradual release of an encapsulated core material, consisting essentially of reacting (a) a partially hydrophilic, partially lipophilic polyfunctional Lewis acid salt in aqueous medium; and (b) a core material and a Lewis base salt in a water-immiscible, slightly polar, organic solvent for the base; in the form of an emulsion consisting essentially of a continuous aqueous phase of Lewis acid salt and water, and a discontinuous droplet phase of core material, Lewis base salt, and organic solvent, to form an anisotropic Lewis acid/Lewis base salt film semipermeable to and encapsulating the core material, and a neutral salt.

4,797,235

PROCESS FOR ENHANCED ORIENTATION OF POLYMERIC FILMS

Steven B. Garland, Simpsonville, and Thomas C. Warren, Greer, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 16, 1987, Ser. No. 39,551
Int. Cl.[4] B29C 35/10
U.S. Cl. 264—22 8 Claims

1. A process for manufacturing a heat-shrinkable oriented polymeric film comprising:

(a) introducing a chemical cross-linking agent to a cross-linkable polymer by blending the chemical cross-linking agent with the cross-linkable polymer,

(b) extruding a film of the blended cross-linkable polymer, said chemical cross-linking agent is originally present in an amount from about 0.001 to about 0.025% by weight,

(c) subjecting the extruded polymer film to electron beam irradiation,

(d) heating and stretching to orient the irradiated extruded polymer film in at least one direction, followed by cooling the film while it is in its stretched condition and

(e) recovering an oriented, heat-shrinkable polymeric film, wherein

(f) both the original amount of chemical cross-linking agent and the dosage of electron beam irradiation are to an extent sufficient to provide an amount of cross-linking effective to accomplish an increased orientation rate.

4,797,236

ULTRAHIGH SPEED INJECTION MOLDING METHOD

Hisashi Kojima, Tokyo, Japan, assignor to Technoplas, Inc., Tokyo, Japan

Continuation of Ser. No. 442,433, Nov. 17, 1982, abandoned.
This application Dec. 18, 1985, Ser. No. 810,892
Claims priority, application Japan, May 9, 1982, 57-77179; May 9, 1982, 57-77180; Jun. 2, 1982, 57-80689[U]
Int. Cl.[4] B29C 45/77
U.S. Cl. 264—40.1 2 Claims

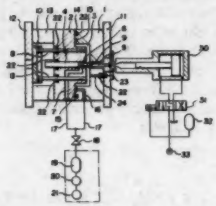
1. An injection molding method, including a filling process in which a plasticized material is injected into a metal mold composed of a stationary mold member and a movable mold member and a molding pressure maintenance process in which the internal pressure of the material which has been injected into the mold is maintained constant, which method comprises the steps of:

predetermining an internal pressure pattern representing reference internal pressure in the mold during a filling time in which the filling process is carried out and during a molding pressure maintenance time in which the internal pressure is maintained, providing the filling time from the

start to the termination of the filling process to be in the range from 0.05 to 0.01 sec., and providing the molding pressure maintenance time following said filling time, said internal pressure pattern having the internal pressure during the molding pressure maintenance time equal to or lower than the pressure during said filling time, and having the maximum internal pressure during the filling time;

tightly sealing the interior of the mold from the atmosphere surrounding the mold;

exerting a large suction on the interior of the mold to evacuate the interior of the mold to a high vacuum at least as low as 10^{-3} torr;



injecting the plasticized material into said mold during said filling time at ultrahigh speed while controlling the internal pressure in the mold in accordance with said predetermined internal pressure pattern, thereby causing the material to fill the interior of the mold before heat escapes from the material sufficient to reduce the viscosity thereof; and

maintaining the internal pressure of the plasticized material under low pressure in the mold during the molding pressure maintenance time in accordance with said predetermined internal pressure pattern, thereby obtaining a molded article with accuracy of dimension on the order of microns corresponding to the dimensions of the mold.

4,797,237

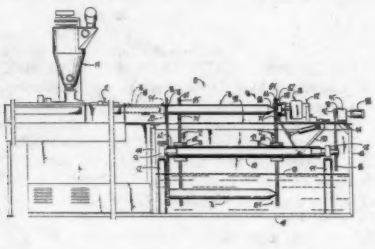
METHOD FOR RECYCLING A BEVERAGE CONTAINER

Floyd V. Hammer, R.R. 1, Union, Iowa 50258, and Brian Harper, Havant, United Kingdom, assignors to Floyd V. Hammer, Union, Iowa

Filed May 4, 1987, Ser. No. 45,387

Int. Cl.[4] B29C *33/34, 47/38, 47/60*

U.S. Cl. 264—45.3 **11 Claims**



1. A method for recycling a beverage container comprising at least a PET body having a metal cap attached thereto, said method comprising:

grinding said entire beverage container, including said body and said metal cap into particles sufficiently small to flow into a screw extruder molding machine;

feeding all of said ground particles from said entire container into said screw extruder molding machine;

applying heat and pressure to said ground particles within said screw extruder molding machine whereby said screw extruder molding machine will convert said ground particles into a softened plastic flowable material capable of being molded and comprising a heterogeneous mixture of at least all of said PET and all of said metal of said cap;

forcing said plastic flowable material formed from said entire beverage container from said screw extruder molding machine into a mold of predetermined shape at a mold filling pressure of from 300 p.s.i. to 1,000 p.s.i whereby said flowable material will assume said predetermined shape of said mold;

cooling said plastic flowable material within said mold whereby said plastic flowable material will harden and form a solid object having said predetermined shape.

4,797,238

RAPID-SINTERING OF ALUMINA

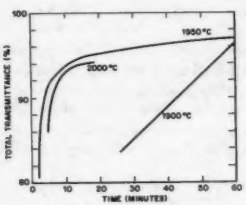
William H. Rhodes, Lexington; George C. Wei, Weston, both of Mass., and George A. Fryburg, Newmarket, N.H., assignors to GTE Laboratories Incorporated, Waltham and GTE Product Corp., Danvers, both of, Mass.

Continuation-in-part of Ser. No. 802,416, Nov. 27, 1985, abandoned. This application May 12, 1987, Ser. No. 53,501

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] C04B *35/10*

U.S. Cl. 264—65 **10 Claims**



1. A process for producing a translucent polycrystalline alumina body comprising:

rapid-sintering a prefired, compacted green body of predetermined shape under a flowing gas mixture of nitrogen and at least about 2.5 volume percent and less than 75 volume percent hydrogen, the green body comprising alumina doped with one or more sintering aids, said rapid-sintering comprising the steps of:

raising the temperature of said prefired compacted green body of predetermined shape up to a maximum sintering temperature at a heating rate greater than or equal to about 0.1° C./second and less than the heating rate at which the green body experiences thermal shock; and

heating the green body at said maximum sintering temperature for a period of time sufficient to produce a translucent polycrystalline alumina body.

4,797,239

FOAM PIG WITH TEXTURED SURFACE

Hyun J. Cho, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Apr. 9, 1987, Ser. No. 36,877

Int. Cl.[4] B29C *67/20*

U.S. Cl. 264—45.5 **5 Claims**

1. A method of manufacturing a pipeline pig having a rough textured surface comprising:

(a) forming a mold having a cavity therein defining the desired exterior configuration of the pipeline pig;

(b) heating the mold to a temperature elevated above ambient to about 130° F. to 150° F.;

(c) injecting a urethane based foamable mixture into the heated mold;

(d) causing the mold to be filled with the injected urethane

based foam and curing the injected urethane based foam within the mold for about 20 to 30 minutes;

(e) controlling the temperature of the mold in step (b) and the curing time in step (d) such as to produce on the

molded pig a tough (texture) textured surface defined by closely spaced indentations of about ¼ to 3 mm. in depth; and

(f) removing the cured pig from the mold.

4,797,240

COMPOSITION AND METHOD FOR PREVENTING THE STAINING OF NITROCELLULOSE FINISHED SHOE UPPERS ATTACHED TO POLYURETHANE SHOE SOLES

Gary D. Andrew, Walnutport; Edward A. Galla, Macungie, and Robert L. Ricci, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 8, 1987, Ser. No. 58,963
Int. Cl.⁴ C08G *18/14*
U.S. Cl. 264—46.4 **16 Claims**

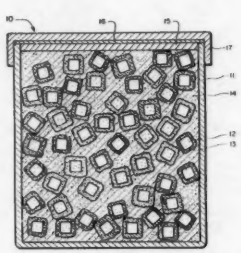
1. In a method for preparing a polyurethane shoe sole for attachment to a nitrocellulose-coated shoe upper which shoe sole is prepared by reacting a mixture comprising a polyisocyanate, a polyester or polyether polyol, a chain extender, a tertiary amine catalyst, a surfactant and water, the improvement which comprises adding a reactive organic halogen compound to the mixture in an amount of about 5–10 wt %, based on total urethane composition, to prevent the staining of the nitrocellulose coated shoe upper.

4,797,241

METHOD FOR PRODUCING MULTIPLE POLYCRYSTALLINE BODIES

Gary R. Peterson, Orem, and M. Duane Horton, Provo, both of Utah, assignors to SII Megadiamond, Provo, Utah

Filed May 20, 1985, Ser. No. 736,422
Int. Cl.⁴ C04B *38/06*
U.S. Cl. 264—63 **27 Claims**



1. A method for producing multiple polycrystalline bodies which method comprises the steps of: shaping quantities of crystals selected from the group consisting of diamond, graphite, cubic boron nitride, hexagonal boron nitride, and combinations thereof into temporarily held bodies of predetermined shapes and sizes in the presence of a temporary binding means;

placing a quantity of said temporarily held bodies into a reaction chamber;

surrounding each of said temporarily held bodies with a powdered pressure transmitting medium after the temporarily held bodies are placed in the reaction chamber; and

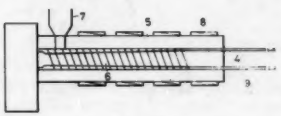
pressing and heating said reaction chamber to a pressure and temperature sufficient to form discrete polycrystalline bodies of approximately the same shapes as said temporarily held bodies of crystals.

4,797,242

METHOD FOR SHAPING THERMOSETTING RESINS

Yoshiaki Fukuda; Takeshi Miyasaka; Iori Matsumoto; Nobukatsu Kato, and Kenji Ema, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 594,663, Mar. 29, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 40,323
Claims priority, application Japan, Mar. 29, 1983, 58-51526; Jun. 14, 1983, 58-104891; Oct. 27, 1983, 58-200038; Oct. 27, 1983, 58-200040; Nov. 2, 1983, 58-204965; Nov. 2, 1983, 58-204966; Nov. 8, 1983, 58-208298
Int. Cl.⁴ B29C *47/78*
U.S. Cl. 264—108 **8 Claims**



1. A method of extrusion-molding a thermosetting resin comprising the following steps:

employing a screw-type extrusion-molding machine which comprises a screw having in sequence a feed zone, a compression zone, a metering zone, and a smooth zone, said smooth zone being in a front section of said screw, said machine further including a first cylinder portion having a heat control mechanism in areas respectively corresponding to the feed, compression, and metering zones, and a second cylinder portion having a heat-supplying capability in an area corresponding to the smooth zone, wherein said screw has a length to diameter ratio of 7 to 40, and a compression ratio of 1.0 to 5.0, a length of the smooth zone being in the range of 1D to 15D, wherein D is a diameter of the screw, wherein said employing step comprises the following steps:

heating the parts of the cylinder which correspond to the compression, metering, and smooth zones of the screw to a temperature in a range of 50° to 200° C.; and

molding said resin in the smooth zone;

said method further comprising the step of thermosetting the resin in the smooth zone to such an extent that the resin after being extruded from the extrusion molding machine is capable of retaining its own shape, wherein said resin is selected from the group consisting of a phenolic resin, a melamine resin, and an epoxy resin.

4,797,243

DYE-CONTAINING POROUS PLASTIC ELEMENT AND METHOD OF MAKING IT

Irving M. Wolbrom, 44 Bayview Ave., Great Neck, N.Y. 11021

Filed Apr. 4, 1988, Ser. No. 177,333
Int. Cl.⁴ B27J *5/00*
U.S. Cl. 264—126 **2 Claims**

1. A method of making a dye-containing porous plastic element, comprising the steps of:

mixing together plastic granules having diameters of between about fifty and eight hundred microns, and water-soluble dry dye granules, and

subjecting the mixture to heat and pressure so as to fuse the granules together into a porous body having interconnected capillary passageways and the dye granules within the passageways.

4,797,244

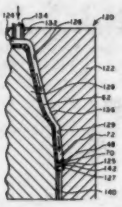
MULTIWALLED CONTAINER AND METHOD OF MAKING SAME

Donald G. Sauer, Harwinton, Conn., assignor to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 426,269, Sep. 29, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 644,056

Int. Cl.[4] B29C *45/14, 45/16, 49/06, 49/22*

U.S. Cl. 264—266 **3 Claims**



1. A method of producing a multiwalled plastic container having a first wall means and a second wall means comprising:

providing a pre-formed thermo-plastic hollow first wall means, said first wall means having a sidewall having an inner and outer surface and defining an opening, said first wall means also having circumferentially-extending lip about said opening, said lip forming an acute angle with said sidewall to provide a trough-like region;

placing said first wall means in an injection-mold cavity having a molding surface to thereby provide a space between first wall means and said molding surface;

injecting a molten plastic material into said space to form said second wall means, said injected plastic entering the trough-like region and re-forming the configuration of said lip, said injected plastic material forming a circumferential rim on said second wall means defining an opening and said injected plastic material forcing said lip against said molding surface to re-form said lip to wrap over and around said rim of said second wall means; and,

removing said first and second wall means from said molding cavity.

4,797,245

INJECTION MOLDING PRESS

Takefumi Sonoda, Yamaguchi, Japan, assignor to Ube Industries, Ltd., Ube, Japan

Filed Oct. 27, 1987, Ser. No. 113,948

Claims priority, application Japan, Nov. 28, 1986, 61-283277; Dec. 2, 1986, 61-287451

Int. Cl.[4] B29C *45/80, 45/23, 45/03*

U.S. Cl. 264—328.4 **15 Claims**

1. A method of operating an injection molding press for injection molding a resin materials, comprising:

preparing a hollow barrel having front and rear sides, a material inlet at the rear side, and valve seat means situated between the front and rear sides,

arranging a plunger in the rear side of the barrel so that a space is formed between a part of an inner surface of the barrel and a part of an outer surface of the plunger, said plunger having valve body means a a front side thereof,

arranging a sleeve in the front side of the barrel so that barrel slides relative to the sleeve,

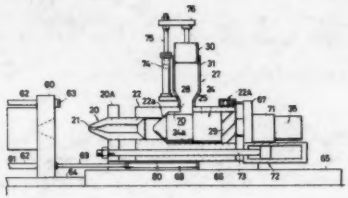
moving the plunger situated in the barrel rearwardly so that the valve body means of the plunger disengages from the valve seat means of the barrel to thereby provide communication between the material inlet and the front side of the barrel,

moving the barrel to a forward position relative to the sleeve so that a part of the sleeve slidably retained in the barrel is located in the front portion of the barrel,

rotating the plunger at a predetermined speed,

charging the resin material into material pushing-supplying means attached to the material inlet of the barrel,

supplying the resin materials from the material pushing-supplying means to the front side of the barrel through the material inlet, the space between the inner surface of the barrel and the plunger and a space between the valve seat means and the valve body means,



reducing the supply pressure of the resin materials at the material pushing-supply means before the total amount of the resin materials is supplied to the material inlet,

stopping rotation of the plunger after the resin materials are completely fed into the front side of the barrel,

moving the plunger relative to the barrel so that the valve body means is seated onto the valve seat means to prevent the resin materials to pass therebetween, and

moving the barrel relative to the sleeve so that the resin materials stored at the front side of the barrel is ejected from the barrel to a mold through the sleeve.

4,797,246

CONTINUOUS MANUFACTURE OF A PERFORATED PLASTIC FILM

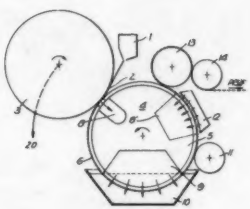
Dietmar Reinke, Ringstrasse 50, 8551 Kirchehrenbach, and Theo Schmidt, Kiefernstrasse 7, 8550 Forchheim, both of Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,717

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303836

Int. Cl.[4] B29C *47/78, 59/00*

U.S. Cl. 264—504 **9 Claims**



1. A method for manufacturing a perforated plastic film utilizing a perforating roller having a sievelike peripheral surface and an interior vacuum source, comprising the steps of:

(a) passing a film in a thermoplastic state from an extruder to the sievelike surface of the perforating roller;

(b) effecting a perforating action on the film with the perforating roller by the air being sucked through the sievelike surface into the interior vacuum source; and

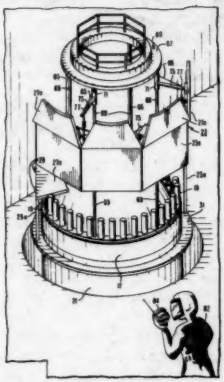
(c) effecting shock cooling of the film substantially simultaneously with the perforating action thereof by sucking cold air through the thermoplastic film during the practice of step (b), and by bringing the film into contact with a cooled back-up roller, the back-up roller being contacted simultaneously with the practice of steps (a) and (b).

4,797,247

THERMAL INSULATION OF NUCLEAR REACTOR

Ronald M. Blaushild, Penn Hills; Leonard R. Golick, Level Green; Stephen L. Samluk, and Richard E. Tome, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,491
Int. Cl.[4] G21C *11/00*
U.S. Cl. 376—289 **13 Claims**



1. A nuclear reactor including a vessel having a body and a removable head, a thermal insulating shield for said head, said sheild including a generally vertical frame of thermal insulation encircling said head, a plurality of panels of thermal insulation extending from said frame, and means, connected to said frame and to each said panel, for connecting each said panel pivotally near the top of said frame so that each said panel is pivotal on said frame between a closed position in which said panels extend over said head and a retracted position, the adjacent edges of said panels mating when said panels are in said closed position whereby in said closed position said panels provide substantially closed thermal insulation at least over a portion of said head and prevent removal or replacement of said head and when said panels are in said retracted position said panels are separated, and permit removal or replacement of said head, and remotely-actuable means, connected to said panels, cooperative with said pivotally-supporting means, for moving said panels between said closed position and said retracted position whereby access for removal of said head is obtainable without exposure of personnel to radioactivity.

4,797,248

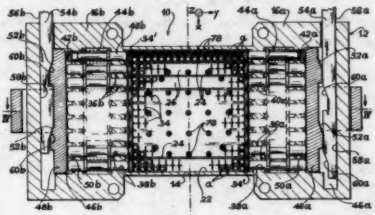
GRIPPING APPARATUS FOR A GROUP OF RODS OF NUCLEAR FUEL ASSEMBLY

Jean Tsitsichvili, Issy les Moulineaux, France, assignor to Cogema-Compagnie Generale des Matieres Nucleaires, France

Filed Dec. 2, 1986, Ser. No. 936,841
Claims priority, application France, Dec. 2, 1985, 85 17779
Int. Cl.[4] G21C *19/33*
U.S. Cl. 376—261 **9 Claims**

1. Apparatus for gripping a bundle of rods (a) arranged in the form of parallel rows of at the most (n) rods, in accordance with a square grid in a nuclear fuel assembly, characterized in that:

said apparatus comprises a body (12) having a central portion (14) provided with a rectangular recess, parallel partitions (24) subdividing said central portion into (p) passageways (26), each of which is able to receive the ends of the rods of, at the most, two rows of adjacent rods; (p) rows of (n+1) mobile members (34,34') located in each of the



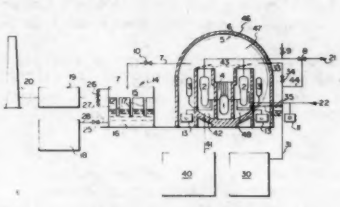
(p) passageways (26), in such a way that the end of each rod can be placed between two adjacent mobile members of the same passageway; locking means (36*a*, 36*b*, 48*a*, 48*b*, 54*a*, 54*b*) located in said body (12) on at least one side of said central portion (14), actuation of said locking means applying to the ends of the rods (a) and the mobile members (34, 34') contained in each of the passageways (26) a force tending to lock each rod between two adjacent mobile members of the same passageway.

4,797,249

PROCESS FOR PRECLUDING OR REDUCING THE DANGER TO A SYSTEM AND THE SURROUNDINGS THEREOF BY REACTIVE MIXTURES

Willy Schweiger, Am Mühlanger 81, D-8039 Puchheim, Fed. Rep. of Germany

Continuation of Ser. No. 342,167, Jan. 25, 1982. This application Jul. 18, 1985, Ser. No. 756,816
Claims priority, application European Pat. Off., Jan. 25, 1981, 81100534.7
Int. Cl.[4] G21C *9/00*
U.S. Cl. 376—279 **8 Claims**



1. A process for precluding or reducing the danger to a non-preinerted nuclear reactor containment system and the enclosed equipment resulting from fission products, and hydrogenhydrogen deflagrations or detonations in the containment atmosphere, which containment atmosphere contains air and hydrogen which hydrogen is generated during a loss of coolant accident, comprising after said loss of coolant accident the steps of:

transferring at least one portion of the air within the containment volume from a part where the release of hydrogen occurs, into at least one area where no hydrogen is released,

said one portion of the air is not containing amounts of hydrogen sufficient for a deflagration,

keeping the hydrogen atmosphere enclosed within the part

of the containment volume where the release of hydrogen occurs and in presence of only another portion of the air, which remains after the transfer of the one portion of the air and which has therefore a small oxygen content insufficient to cause catastrophic oxygen-hydrogen reaction in the one part of the containment volume.

4,797,250

NUCLEAR REACTOR CONFINEMENT ENCLOSURE FOUNDATION

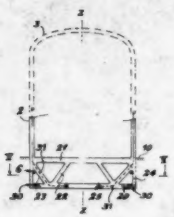
Philippe Moreau, Neuilly, France, assignor to Framatome, Courbevoie, France

Filed Aug. 19, 1987, Ser. No. 87,007

Claims priority, application France, Aug. 21, 1986, 86 11946

Int. Cl.[4] G21C *13/00*

U.S. Cl. 376—293 **8 Claims**



1. A nuclear reactor confinement enclosure comprising a foundation and a skirt connected to said foundation, wherein said foundation comprises a horizontal, concrete footing embedded in the ground, and two groups of oblique frusto-conical or planar concrete slabs bearing on said footing and supporting said confinement enclosure, a first group of said slabs being inclined towards the inside of said footing and prestressed slabs of a second group of said slabs being inclined towards the outside of said footing, disposed around and facing the slabs of said first group, and being connected to said skirt.

4,797,251

PROCESS FOR FIXING METAL POWDER MOLDING AT SINTERING

Takahumi Sakuramoto; Eishi Asoshina; Takashi Tominaga; Ichiro Ijichi; Kiyohiro Kamei, and Toshiharu Konishi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 728,538, Apr. 29, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 939,298

Claims priority, application Japan, Apr. 29, 1984, 59-87313; Apr. 29, 1984, 59-87314; Apr. 29, 1984, 59-87315

Int. Cl.[4] B22F *7/04*

U.S. Cl. 419—9 **12 Claims**

1. A process for forming a metal layer from a metal power molding on a metal base material which comprises:

interposing a composition for adhering and fixing the metal powder molding to the metal base material between the metal powder molding and the metal base material by placing a sheet of the composition between the metal power molding and the metal base material or by coating at least one of the metal powder molding and the metal base material with the composition, to thereby form a composite of the metal powder molding, the composition and the metal base material, wherein the composition comprises a thermosetting resin composition containing a mixture of a thermosetting resin and at least one member selected from the group consisting of a metal fine powder, a thermoplastic resin and an adhesive material; and

sintering the composite of the metal powder molding, the composition and the metal base material in a non-oxidizing atmosphere until the amount of residual carbon of the composition after completion of sintering is at least about 0.5% by weight and the metal powder molding yields the metal layer on the metal base material, wherein the metal powder molding is formed by rolling a mixture of a metal powder and a synthetic resin-based binder.

4,797,252

CORROSION-RESISTANT, LOW-CARBON PLUS NITROGEN AUSTENITIC STAINLESS STEELS WITH IMPROVED MACHINABILITY

John J. Eckenrod, Coraopolis; Geoffrey O. Rhodes, Saxonburg; Kenneth E. Pinnow, Pittsburgh, all of Pa., and William E. Royer, Lafayette, N.Y., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Sep. 19, 1986, Ser. No. 910,238

Int. Cl.[4] C22C *38/40*

U.S. Cl. 420—42 **16 Claims**

1. A corrosion resistance fully austenitic stainless steel having improved machinability consisting essntially of, in weight percent, carbon plus nitrogen up to about 0.052, chromium 16 to 20, nickel 8 to 12, sulfur 0.026 to 0.07, manganese up to 2.0, silicon up to 1.0, phosphorus up to 0.05, molybdenum up to 3.0, copper up to 1.0 and the balance iron with incidental impurities.

4,797,253

LAMINATED FABRIC COATED PLASTIC MATERIAL

Kurt Petersen, No. 18 Kongebakken, DK-5700 Svendborg, Denmark

PCT No. PCT/DK87/00026, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05953, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 26, 1987, Ser. No. 126,130

Int. Cl.[4] A41D *31/02*; B32B *3/26, 7/12, 27/16, 27/32*

U.S. Cl. 428—196 **4 Claims**

1. A laminated fabric coated plastic material with insulating properties and comprising plastic encapsulated air cells, characterized in that it is produced by

(a) radiating with beta- and/or gamma-rays an air cell sheet of polyethylene, known per se and consisting of two welded layers, one of which is plane and the other encloses blisters which together with the plane layer form airfilled cells,

(b) coating one or both sides of the radiated air cell sheet with a web of hot melt adhesive film,

(c) coating the surface of said adhesive film with a web of fabric material, and

(d) heating the sheets for melting the adhesive film and compressing the heated sheets.

4,797,254

PROTECTION MEANS FOR A PROCESS ANALYZER SYSTEM

Rudolf Seidel, Basel, Switzerland, assignor to Benke Instrument & Elektro Ag, Pratteln, Switzerland

Filed Mar. 9, 1987, Ser. No. 23,391

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1986, 3609929

Int. Cl.[4] G01N *37/00*

U.S. Cl. 422—49 **17 Claims**

1. A process analyzer system comprising:

at least one means for preparing samples;

at least one process analyzer;

at least one auxiliary material system;

unidirectional or bidirectional communications means for transmitting electrical signals;

self-supporting and sealed housing means for enclosing a housing interior in an explosion-proof manner;

said housing means comprising a stationary housing part, a door member and an opening in said stationary housing part and said door member serving to close said opening;

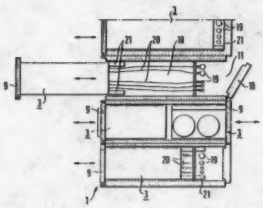
movable support means for carrying said process analyzer,

said means for preparing samples, said auxiliary material system and said unidirectional or bidirectional communications means;

means for mounting said support means for displacement to and from the housing interior of said housing means through said opening;

said support means being connected at a front side thereof with said door member;

flexible supply and disposal lines connecting said support means to said stationary housing part;



means for closing said door;

means for protecting said system against an explosion and/or against the environment;

monitoring means for coupling said door closing means to said explosion and/or environment protection means so that opening of said door member is only possible in a safe state; and

at least one keyboard and observation station provided on the outside of said housing means for locally checking said system.

4,797,255

STERILIZATION METHOD AND APPARATUS THEREFOR

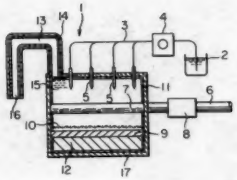
Koichi Hatanaka, Sayama, and Yoshito Shibauchi, Kawagoe, both of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Filed Mar. 16, 1987, Ser. No. 26,384

Claims priority, application Japan, Mar. 24, 1986, 61-65346; Jul. 24, 1986, 61-174235

Int. Cl.[4] A61L *2/18, 2/20*

U.S. Cl. 422—28 **4 Claims**



1. A method of sterilizing an object to be sterilized, said method comprising:

dropping hydrogen peroxide in the form of liquid droplets having a diameter of 1 to 3 mm. onto an evaporation surface of a heater, whereby said hydrogen peroxide liquid is instantaneously gasified, said heater being heated to a temperature between 140 and 180 degrees C., whereby decomposition of hydrogen peroxide during said gasification is minimized;

sweeping said hydrogen peroxide gas from the evaporator surface by transport air heated to a temperature which is at least substantially equal to the temperature of said evaporation surface to a surface of an object to be sterilized through a guide pipe heated to a temperature which is at least substantially equal to the temperature of said evaporation surface;

condensing said hydrogen peroxide gas at about ambient pressure at said surface of said object, said surface of said object being maintained at a temperature which is lower than the condensing temperature of said hydrogen peroxide gas so as to sterilize said object; and

removing condensed hydrogen peroxide from said object by drying with hot air.

2. A sterilization apparatus comprising:

(1) means for forming droplets of liquid hydrogen peroxide fluidly connected to a source of liquid hydrogen peroxide wherein the diameters of said liquid droplets are between 1 and 3 mm., said liquid hydrogen peroxide being fed to the forming means by a constant amount feeder means;

(2) an evaporator surface disposed such that said formed droplets are dropped thereunto;

(3) a heater means associated with the evaporator surface such that said evaporator surface is maintained at a temperature between 140 and 180 degrees C. while said liquid droplets are dropped thereonto, whereby the liquid droplets are instantaneously gasified to hydrogen peroxide gas and the decomposition of the hydrogen peroxide during said gasification is minimized;

(4) transport air supply means for supplying transport air near said evaporator surface for transporting the gasified hydrogen peroxide to articles to be sterilized;

(5) guide means for guiding said gasified hydrogen peroxide contained in said transport air to objects to be sterilized, said guide means having heating means for maintaining the temperature of the gasified hydrogen peroxide and transport air at least at the evaporation temperature of the hydrogen peroxide.

4,797,256

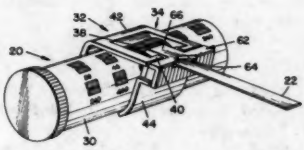
REGISTRATION DEVICE FOR BLOOD TEST STRIPS

Thomas M. Watlington, IV, Indianapolis, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Jun. 5, 1987, Ser. No. 59,789

Int. Cl.[4] G01N *1/48, 21/06;* **B01L** *9/00*

U.S. Cl. 422—58 **19 Claims**



1. A system of testing for glucose in whole blood comprising:

a cylindrical vial for containing a plurality of inactivated test strips which are selectively removable therefrom, each test strip provided with a reagent area adapted to receive a blood sample thereon and thereby being activated to indicate a particular color consistent with the condition of the blood and the time elapsed since reception of the blood sample thereon, said vial having an outer peripheral surface;

a plurality of graduated markings on said peripheral surface providing a range of different colors which are indicative of a range of possible conditions which might be evidenced by an activated test strip;

holder means slidably mounted on said outer peripheral surface and including a support region for slidably receiving the reagent area of an activated test strip, said holder means defining a window for outlining, simultaneously, at least one of said markings on said peripheral surface and on the reagent area of the activated test strip;

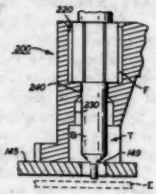
thereby enabling the reagent area on the activated test strip to be matched with an appropriate one of said markings on said peripheral surface to thereby indicate the condition of the blood being sampled.

4,797,257

SLIDE HOLDER AND TIP LOCATOR

James D. Shaw, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,477
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **4 Claims**



1. In a slide holder for mounting a slide in an analyzer in position to receive liquid dispensed from a dispensing tip having a barrel and grasping fins, the holder comprising a body portion, means on said body portion for releasably holding a slide constructed to assay for an analyte of a liquid, and a dispensing tip guide and support turret for positioning a dispensing tip in proper relationship to a held slide;

the improvement wherein said guide and support turret has two passageways extending therethough to a position just above said slide-holding means, constructed so that a liquid-dispensing tip is selectively positionable in one or the other passageway for dispensing liquid on either a colorimetric or potentiometric slide, said passageways including a shoulder dimensioned to position and support such tips based on the barrel of the tip rather than the grasping fins,

whereby any overlap of said passageways is minimized and the disposable tip is stabilized when positioned in one or the other passageway.

4,797,258

CHEMICAL REACTION APPARATUS

Ei Mochida, Tokyo, Japan, assignor to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,551
Claims priority, application Japan, Nov. 10, 1984, 59-236907
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **64 Claims**

1. A chemical reaction apparatus comprising:

a plurality of cylindrical reaction containers;

at least one endless travelling belt constructed and arranged for supporting thereon said plurality of cylindrical reaction containers arranged in parallel;

driving means for advancing said at least one travelling belt at a constant speed in one horizontal direction;

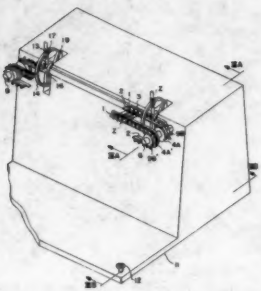
separate endless retaining belts disposed on each side of said at least one travelling belt, said retaining belts being disposed parallel to and not contiguously to said at least one travelling belt, each retaining belt being provided thereon with a multiplicity of teeth projecting up at fixed, spaced intervals slightly greater than the diameter of said reaction containers, and adapted to retain said reaction containers at fixed relative positions, portions of said retaining belt teeth being positioned lower than the surface of the travelling belt;

a base on a frame of the apparatus adjacent said at least one endless travelling belt and said endless retaining belts constructed and arranged for supporting bottoms of said reaction containers;

drive means for advancing said retaining belts intermittently over fixed intervals of space; and

means for maintaining said cylindrical reaction containers on said at least one travelling belt at an angle inclined with respect to a horizontal plane;

said base and retaining belts cooperating with one another to maintain the plurality of cylindrical reaction containers in



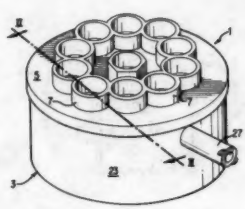
juxtaposed position relative to one another with respective tops of the containers positioned above corresponding container bottoms so that a central axis of each of the containers is on a plane inclined at said angle relative to a horizontal plane; and said travelling belt driving means and said retaining belt drive means cooperating with one another and with said travelling and retaining belts to rotate each container about its respective central axis and allow a required chemical reaction to proceed therein.

4,797,259

WELL-TYPE DIAGNOSTIC PLATE DEVICE

Vlado I. Matkovich, Glen Cove; Jerold Martin, New York, and Peter J. Degen, Huntington, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,386
Int. Cl.[4] C12M *1/20*
U.S. Cl. 422—101 **35 Claims**



1. A diagnostic test device comprising:

a plate,

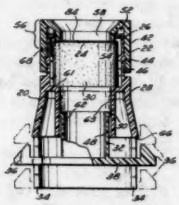
at least one well formed in said plate, said at least one well having an open bottom, and

a composite membrane having at least three layers including, sequentially, a microporous liquophilic reaction layer, a sealing layer, and a liquophobic barrier layer having at least one aperture therein for each said well and located substantially at the center of the well, said composite membrane coextensive with the bottom of said at least one well and forming a liquophobic, liquid-tight seal at the periphery of the well.

4,797,260
ANTIBODY TESTING SYSTEM

James E. Parker, Long Beach, Calif., assignor to V-Tech, Inc., Pomona, Calif.

Filed Jan. 27, 1987, Ser. No. 6,874
Int. Cl.[4] B01D *29/00*; B01L *11/00*
U.S. Cl. 422—101 16 Claims

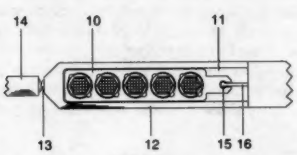


1. An apparatus for testing, comprising:
a membrane having a component reactive with a specific compound bound to the membrane, said membrane allowing the passage of liquid;
a body member having:
an internal piston housing; and
a porous membrane support mounted adjacent said piston housing having a first side adjacent to and contacting said membrane and a second side defining the upper surface of said piston housing; and
a piston, sealingly engaged with said piston housing for movement from a first position to a second position within said piston housing to create a zone of reduced pressure below said porous membrane support to facilitate passage of liquid through said porous membrane support.

4,797,261
MULTIPLE SPECIMEN CRYOTRANSFER HOLDER FOR ELECTRON MICROSCOPES

Peter R. Swann, Diablo, and Joseph S. Jones, Livermore, both of Calif., assignors to Gatan Inc., Pleasanton, Calif.

Filed Nov. 3, 1987, Ser. No. 116,167
Int. Cl.[4] G01N *21/01*; B01L *11/00*
U.S. Cl. 422—102 3 Claims

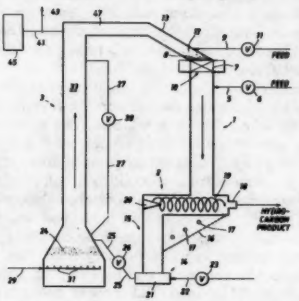


1. A specimen cooling holder for a transmission electron microscope including:
a cooling means for cooling the high thermal conductivity tip of said specimen cooling holder,
a low thermal conductivity bearing between said tip and a transmission electron microscope stage,
a recess within said tip, said recess being trough-shaped proximal to said low thermal conductivity conductivity bearing and being tube-shaped distal from said low thermal conductivity conductivity bearing,
an opening interconnecting the two sections of said recess,
a specimen cartridge dimensioned to fit closely within said recess and constructed from a material of high thermal conductivity,
a plurality of holes passing completely through said specimen cartridge,
securing means for securing specimens within said holes,
and a translating means for moving said specimen cartridge within said recess such that said specimen cartridge can be withdrawn inside the tube-shaped portion of said recess or positioned at any point within said recess,
whereby a plurality of specimens may be positioned in the tube-shaped part of said recess and thereby kept cold and shielded from frosting during transfer into said transmission electron microscope.

4,797,262
DOWNFLOW FLUIDIZED CATALYTIC CRACKING SYSTEM

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 874,758, Jun. 16, 1986, Pat. No. 4,693,808.
This application Jun. 3, 1987, Ser. No. 56,929
Int. Cl.[4] B01J *8/18*
U.S. Cl. 422—142 19 Claims



1. An integral hydrocarbon catalytic cracking conversion apparatus for the catalytic conversion of a hydrocarbon feed material to a hydrocarbon product material having smaller molecules which comprises:
(a) an elongated catalytic downflow reactor having a top and bottom portion comprising a hydrocarbon feed inlet at a position juxtaposed to said top portion of said downflow reactor, a regenerated catalyst inlet at a position juxtaposed to said top portion of said downflow reactor and a product and spent catalyst withdrawal outlet at a position juxtaposed to said bottom portion of said downflow reactor;
(b) an elongated upflow catalytic riser regenerator having a top and bottom portion for regeneration of spent catalyst passed from said catalytic downflow reactor having a spent catalyst inlet at a position juxtaposed to said bottom portion of said regenerator, a regeneration gas inlet means for entry of an oxygen-containing gas at a position juxtaposed to said bottom portion of said regenerator, a uniform fast fluidized or entrained bed of regenerating catalyst situated from near said bottom to near said top of said riser regenerator and a regenerated catalyst and vapor phase outlet at a position juxtaposed to said top portion said regenerator, said outlet having a means to remove regenerated catalyst and vapors resultant from the oxidation of coke, present on said spent catalyst, with said oxygencontaining regeneration gas;
(c) a horizontal cyclonic separator for separating spent catalyst from hydrocarbon product material, said horizontal cyclone separator being in communication with said bottom portion of said catalytic downflow reactor and said bottom portion of said upflow riser regenerator and comprising:
(i) a horizontal elongated vessel having a body comprising a top having a center line, a first imperforate sidewall, a

bottom and a perforate second side wall for penetration of a hydrocarbon product outlet withdrawal conduit, said top of said vessel body communicating with said catalytic downflow reactor to form a point of communication at a location off center from the center line of said top of said vessel as defined by a vertical plane through the diameter of said horizontal body, said point of communication being sufficient to provide passage of an admixture of spent catalyst and hydrocarbon products in a downward direction into said elongated vessel;

(ii) a downcomer elongated relatively vertical conduit interconnecting said vessel bottom at the relatively opposite extreme end of said vessel from said communication of said vessel with said catalytic downflow reactor for passage downward through said downcomer vertical conduit of a relatively minor amount of spent catalyst;

(iii) a hydrocarbon product withdrawal conduit situated in said second side wall of said vessel beneath and to the side of said point of communication of said catalytic downflow reactor with said top of said vessel for the continuous removal of said hydrocarbon product after a secondary centrifugal separation from spent catalyst;

(iv) an inclined slot solid dropout means interconnecting said bottom of said vessel at a position at least 90° separated from said catalytic downflow reactor point of communication with said top of said vessel as measured by an angle around the horizontal circumference of said vessel where 360° degrees equal one complete revolution around said circumference, said dropout means receiving spent catalyst by primary mass separation of spent catalysts from said hydrocarbon product by centrifugal acceleration of spent catalyst about said angle of at least 90° degrees in said horizontal vessel, wherein spent catalyst is accelerated against said horizontal circumference to cause primary mass flow separation and to thereby pass the majority of spent catalyst through said inclined solid dropout means to said downcomer vertical conduit;

(v) wherein said horizontal cyclonic separator and said catalytic downflow reactor are constructed to insure that the diameter of said hydrocarbon product withdrawal conduit is smaller than the diameter of said horizontal vessel and said off center ingress of said admixture of said hydrocarbon product and spent catalyst are constructed to develop a swirl ratio of greater than 0.2 defined by the tangential velocity of said hydrocarbon product across the cross section of said catalytic downflow reactor divided by the superficial axial velocity of fluid through the cross section of said hydrocarbon product withdrawal conduit to produce a vortex of hydrocarbon product with entrained minor quantities of spent catalyst in a helical path extending from said imperforate wall opposite said hydrocarbon product withdrawal conduit to cause said secondary centrifugal separation and disengagement of a minor amount of entrained spent catalyst from said helical hydrocarbon product and thereby passage of a disengaged minor amount of disentrained spent catalyst to the point of interconnection of said vessel with said downcomer vertical conduit to pass disengaged and separated spent catalyst through said downcomer conduit to a stripping zone; and

(vi) a stripping zone communicating with said downcomer vertical conduit and said bottom portion of said upflow riser regenerator, said stripping zone comprising a dense bed of spent catalyst received from both 1) said primary mass flow separation via said inclined slot solid dropout means and 2) said secondary centrifugal separation via said downcomer vertical conduit, wherein stripping gas is passed to said stripping zone by means of a stripping gas inlet means and wherein said helical flow path of said hydrocarbon product material extending from said second side wall to said hydrocarbon product material withdrawal outlet prohibits at least a portion of stripping gas from passing upward through said downcomer vertical conduit and into said horizontal vessel;

(d) a connection separation means communicating with said top of said upflow riser regenerator and said top of said catalytic downflow reactor to separate regenerated catalyst, derived from said upflow riser regenerator, from spent oxidation gases, said connection separation means providing a relatively dense phase of catalyst intermediate said top of said catalytic downflow reactor and said top of said upflow regenerator; and

(e) a pressure reduction means to attain a higher pressure in said relatively dense phase in said connection separation means immediately upstream of said catalytic downflow reactor compared with the pressure in said top portion of said catalytic downflow reactor.

4,797,263

MONOLITHIC CATALYTIC CONVERTER WITH IMPROVED GAS DISTRIBUTION

Rajshekhar D. Oza, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 836,699, Mar. 6, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 82,929

Int. Cl.[4] F01N *3/24*; B01D *53/36*

U.S. Cl. 422—176 **2 Claims**

1. A method of redistributing exhaust gases from an internal combustion engine comprising providing a catalytic converter consisting essentially of a housing, a catalyst coated monolith and a downstream deflector adjacent a downstream face of the monolith, passing exhaust gases through the monolith and downstream deflector and selectively blocking flow across the entire downstream race of said monolith to produce a centrally located, relatively small, restricted flow region and a radially outwardly located, relatively large substantially unrestricted flow region parallel to said central region, whereby a substantially uniform distribution of gases between the passages at their entrance to the monolith is achieved without increasing catalyst warm-up time or adding substantial back pressure.

4,797,264

RECOVERY OF METALS ADSORBED ON CHELATING AGENTS

Yasuhiko Inoue; Masaaki Matsuda, and Yoshirou Akiyoshi, all of Ehime, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 27, 1986, Ser. No. 867,061

Claims priority, application Japan, May 28, 1985, 60-115089; Jun. 17, 1985, 60-131199

Int. Cl.[4] C01G *43/00*; B01J *45/00, 49/00*

U.S. Cl. 423—7 **6 Claims**

1. A method for eluting a metal absorbed on a chelating agent, said metal being uranium, molybdenum, rhenium, titanium, vanadium, germanium, or tungsten, said agent having at least one of the functional groups selected from the group consisting of —NOH, —$P(OR)_2$, —$PO(OR)_2$, —$PH(OR)_3$, —SR, $N(R)_2$, —$N^+(R)_3$, and alkali or alkaline earth metal salts thereof where R may be the same or different and stands for a

hydrogen atom, phenyl group, alkyl group or alkenyl group, which comprises:

bringing the chelating agent having the metal absorbed thereon into contact with an eluent containing both

(1) at least one reducing agent selected from the group consisting of sulfurous acid, nitrous acid, thiosulfuric acid and, their alkali metal salts, sodium borohydride, hydrogen peroxide, sulfur dioxide, hydrazine, phenylhydrazine, hydroxylamine, hydroquinone, oxalic acid, and formaldehyde, and

(2) at least one basic compound selected from the group consisting of inorganic alkaline compounds and water soluble organic amines.

4,797,265

PROCESS FOR THE PRODUCTION OF HIGHLY CONCENTRATED PHOSPHORIC ACID

Tadashi Inoue; Akira Ohkoba; Kunio Sakashita; Akira Utsunomiya; Takeki Shinozaki, all of Shimonoseki, and Minoru Ieda, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 12, 1987, Ser. No. 25,159

Claims priority, application Japan, Aug. 12, 1986, 61-290583

Int. Cl.[4] C01B *25/16*; C01F *1/00, 11/46*

U.S. Cl. 423—320 **14 Claims**

1. A process for the production of highly concentrated phosphoric acid, comprising digesting phosphate rock with a mixed acid consisting essentially of sulfuric acid and phosphoric acid to obtain a slurry comprising phosphoric acid and hemihydrate, calcium sulfate $CaSO_4 \cdot \frac{1}{2}H_2O$, then filtering the slurry, taking out highly concentrated phosphoric acid as product acid and subsequently hydrating the hemihydrate to obtain gypsum dihydrate, $CaSO_4 \cdot 2H_2O$, the process which comprises:

mixing phosphate rock into a portion of the slurry comprising highly concentrated phosphoric acid and hemihydrate after completion of the digestion to obtain a premixed slurry;

forming a recycle acid using substantially the bulk of washed filtrate obtained by washing hemihydrate cake from a hemihydrate filter and also using a portion of the highly concentrated phosphoric acid as product acid;

adding concentrated sulfuric acid to tee recycle acid to obtain a mixed acid consisting essentially of sulfuric acid and phosphoric acid and having a sulfuric acid concentration in this mixed acid adjusted to less than 60% by weight;

adding this mixed acid to the premixed slurry and allowing digestion to take place at a temperature in the range of 70° to 85° C. to obtain a slurry comprising highly concentrated phosphoric acid having a concentration of at least 40% P_2O_5 by weight and including a concentration of at least 0.5% excess H_2SO_4 by weight and hemihydrate;

recycling a portion of this slurry just obtained as a premixing slurry to a premixer, while filtering another portion thereof by the hemihydrate filter to separate it into the highly concentrated phosphoric acid as product acid and hemihydrate;

using a portion of the product acid just obtained for the formation of the recycle acid;

while washing the hemihydrate cake on the hemihydrate filter with mother filtrate provided from a dihydrate filter;

using substantially the bulk of the resulting washing filtrate from a hemihydrate filter for the formation of the recycle acid;

while slurrying the washed hemihydrate cake using washed filtrate obtained by water-washing dihydrate cake from dihydrate filter and also using a two- to five-fold amount of the same slurry, based on the amount of dihydrate slurry obtained after the completion of hydration;

adding concentrated sulfuric acid to the resulting slurry and allowing hydration of the hemihydrate to take place under strong agitation to obtain a dihydrate slurry;

filtering this dihydrate slurry by the dihydrate filter followed by water-washing; and

using the resulting mother filtrate for washing hemihydrate cake on the hemihydrate filter.

4,797,266

METHOD OF PREPARATION OF A COMBINED ZSM-5-FERRIERITE ALUMINOSILICATE

Wayne E. Evans, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 7, 1986, Ser. No. 894,164

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **7 Claims**

1. A method of preparation of a combined ZSM-5 and ferrierite aluminosilicate which comprises crystallizing, at crystallization conditions, an aqueous crystallization admixture comprising sodium silicate, a compound of aluminum, sodium oxide, water and a combination of amines comprising piperidine and an aliphatic amine selected from the group consisting of n-butylamine, tetrapropylammonium hydroxide, and mixtures thereof, wherein said components are present in a content expressed by:

silica:alumina:sodium oxide:water:total amine content equal to 25:XXX:YYY:350–2000:3–20

wherein XXX is equal to 0.1 to 2.0

wherein YYY is equal to 0.2 to 10 and

wherein the ratio of piperidine to said chosen aliphatic amine is equal to 0.1 to 20.

4,797,267

METHOD OF PRODUCING ROD-SHAPED ZSM-5 ZEOLITE

Guenter H. Kuehl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1987, Ser. No. 139,098

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—329 **4 Claims**

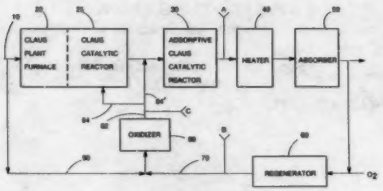
1. In the process for the production of high-silica ZSM-5 zeolites having a silica to alumina molar ratio of greater than 70 from a reaction mixture containing a source of alkali metal oxide, a source of silica, quaternary ammonium ion and water wherein the reaction mixture is held at elevated temperatures and pressures until crystals are formed, the improvment which comprises adding to said reaction mixture a non-fluoride buffer capable, at temperatures of about 200° C., of controlling the final pH to a value within the range of 9.5–10.5, in such amounts that about 0.1 to 0.35 equivalents of buffer per mol of silica are present in the reaction medium, so as to produce rod-shaped ZSM-5 having a length-to-width ratio greater than 3, wherein the buffer is selected from the group consisting of ammonium or alkali metal salts of phosphate, tartrate, citrate, oxalate, ethylenediaminetetraacetate and acetate.

4,797,268

SULFUR RECOVERY PROCESS USING METAL OXIDE ABSORBENT WITH REGENERATOR RECYCLE TO CLAUS CATALYTIC REACTOR

John J. McGovern; Paul T. Pendergraft, and Min-Hsiun Lee, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 30, 1987, Ser. No. 126,815
Int. Cl.[4] C01B 17/04
U.S. Cl. 423—574 R 14 Claims



8. Method comprising:

converting H_2S in an acid gas feedstream to a Claus plant to elemental sulfur by the Claus reaction and producing a Claus plant tailgas in a Claus plant comprising a Claus furnace and a Claus catalytic reactor;

removing both H_2S and SO_2 in the presence of ZnO, optionally after converting SO_2 to H_2S, producing ZnS and absorber effluent;

regenerating ZnS to ZnO in the presence of O_2 producing regenerator effluent;

providing a portion of acid gas feedstream withdrawn upstream of the Claus furnace to oxidation means distinct from the Claus furnace for oxidizing H_2S to SO_2 in the presence of O_2;

further providing regenerator effluent to the oxidation means; and

providing effluent from the oxidation means to the Claus catalytic reactor of the Claus plant.

4,797,269

PRODUCTION OF BETA ALUMINA BY SEEDING AND BETA ALUMINA PRODUCED THEREBY

Ralph Bauer, Niagara Falls, Canada, and Rufus M. Franklin, Holden, Mass., assignors to Norton Company, Worcester, Mass.

Filed Feb. 8, 1988, Ser. No. 153,676
Int. Cl.[4] C01F 7/04
U.S. Cl. 423—600 8 Claims

1. A method of making a beta alumina body, comprising:

(a) providing a composition consistent with the formation of beta alumina upon firing, said composition comprising (i) an alumina sol or gel, (ii) a material selected from the group consisting of oxides and precursors of oxides of sodium, potassium, lithium, magnesium, and calcium, and (iii) submicron seed particles selected from the group consisting of beta alumina and alpha alumina, said seed particles being present in an amount of at least 0.1% by weight of the final solids content of said body;

(b) shaping said gel or sol;

(c) drying the shaped gel sol from step (b); and

(d) firing the dried shaped gel from step (c) at a temperature of from 1200° C. to 1500° C. to produce said beta alumina body, said seed particles being present in said gel or sol in an amount at least equivalent to 10^6 particles per cubic centimeter of said beta alumina body.

4,797,270

METHOD FOR THE OBTENTION OF AN ESPECIAL ALUMINA FROM THE POWDER PRODUCED IN METALLURGICAL ALUMINA CALCINATION

José M. Alarado Cendan, and Flor Campa Campa, both of Foz, Spain, assignors to Alumina Espanola S.A., Spain

Filed Sep. 3, 1987, Ser. No. 92,674
Claims priority, application Spain, Jul. 17, 1987, 8702105
Int. Cl.[4] C01F 7/02
U.S. Cl. 423—625 14 Claims

1. A method for obtaining special alumina from powder produced in the calcination of metallurgical alumina comprising

(a) calcining metallurgical alumina

(b) collecting said calcined alumina powder said powder being extremely thin and formed by a mixture of aluminas of different calcination degree, both mono and tri-hydrate and with a high sodium content,

(c) washing the powder in water in order to reduce its sodium content, repulping it in a tank with stirring,

(d) separating solid and liquid by decantation,

(e) filtering, and washing in water,

(f) calcining at a high temperature, whereby the powder is transformed into special alumina or corindon and

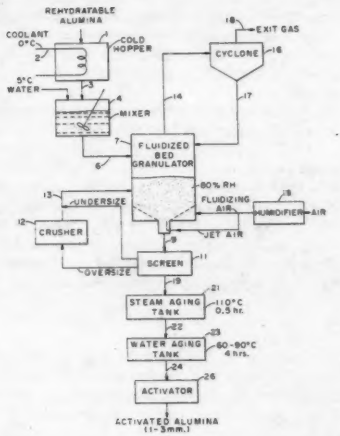
(g) grinding the obtained product.

4,797,271

PRODUCING ALUMINA GRANULES IN A FLUIDIZED BED

Hubert L. Fleming, Mars; Jon F. Edd, Monroeville; Alan Pearson, Murrysville, all of Pa.; Chin-Liang Chou, Terre Haute, Ind.; Hisashi O. Kono, and Ching-Chung Huang, both of Morgantown, W. Va., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 16,631, Feb. 19, 1987, Pat. No. 4,704,378. This application Oct. 22, 1987, Ser. No. 111,218
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.[4] C01F 7/02
U.S. Cl. 423—625 20 Claims



1. A process for preparing granules of alumina comprising:

(a) pretreating alumina powder by admixing said powder with cold water in a mixer at a temperature below about 20° C. to form a stabilized alumina having a pore volume partially saturated with water; and

(b) agglomerating said pretreated alumina in a fluidized bed to form granules having a high macropore volume.

4,797,272

WATER-IN-OIL MICROEMULSIONS FOR COSMETIC USES

Edwards E. Linn, Carmel, and Michael P. West, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 15, 1985, Ser. No. 798,501
Int. Cl.[4] A61K *7/42, 7/44, 7/48, 9/10*
U.S. Cl. 424—59 **20 Claims**

1. A stable water-in-oil microemulsion non-irritating moisturizing composition which when applied to skin promotes the penetration of moisturizers into the skin and leaves little residue on the surface of the skin following its application comprising from about 5% by weight to about 35% by weight of a moisturizer, from about 20% by weight to about 80% by weight of surfactants, from about 10% by weight to about 70% by weight of skin compatible oils, and from about 5% by weight to about 50% by weight of skin humectants and the composition having an average droplet size in the range of about 0.001 microns to about 0.2 microns in diameter, and wherein the compositon is adapted to promote the penetration of the moisturizers into the skin.

4,797,273

SKIN MOISTURIZING MICROEMULSIONS

Edwards E. Linn, Wanaque, N.J., and Thomas O. York, Indianapolis, Ind., assignors to Elizabeth Arden Inc., New York, N.Y.

Continuation-in-part of Ser. No. 798,501, Nov. 15, 1985. This application Nov. 7, 1986, Ser. No. 928,217
Int. Cl.[4] A61K *7/42, 7/44, 7/48, 9/10*
U.S. Cl. 424—59 **57 Claims**

1. A method of moisturizing human skin comprising administering to skin in need of moisturizing an effective amount of a stable water-in-oil or oil-in-water microemulsion non-irritating moisturizing composition which when applied to skin promotes the penetration of moisturizers into the skin and leaves little residue on the surface of the skin following its application selected from the group consisting of one of the following compositions comprised of

(a) from about 1.0% by weight to about 36.0% by weight of a fatty alcohol, from about 23.5% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 28.0% by weight of a polysiloxane, and from about 2.0% by weight to about 36.0% by weight of a skin humectant;

(b) from about 1.0% by weight to about 46.0% by weight of an animal oil, from about 14.0% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 35.0% by weight of a polysiloxane, and from about 2.0% by weight to about 18.0% by weight of a skin humectant;

(c) from about 1.0% by weight to about 31.0% by weight of a triglyceride, from about 37.0% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 35.0% by weight of a polysiloxane, and from about 2.0% by weight to about 24.0% by weight of a skin humectant;

(d) from about 1.0% by weight to about 41.0% by weight of a fatty diester, from about 23.0% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 31.0% by weight of a polysiloxane, and from about 2.0% by weight to about 42.0% by weight of a skin humectant;

(e) from about 1.0% by weight to about 41.0% by weight of a branched chain fatty ester, from about 18.5% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 31.0% by weight of a polysiloxane, and from about 2.0% by weight to about 54.0% by weight of a skin humectant;

(f) from about 1.0% by weight to about 6.0% by weight of a fatty acid, from about 60.0% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 5.0% by weight of a polysiloxane, and from about 2.0% by weight to about 26.0% by weight of a skin humectant;

(g) from about 1.0% by weight to about 41.0% by weight of a tribasic acid ester, from about 23.0% by weight to about 90.0% by weight of a microemulsion forming surfactant, from about 1.0% by weight to about 31.0% by weight of a polysiloxane, and from about 3.0% by weight to about 33.0% by weight of a skin humectant;

(h) from about 3.0% by weight to about 35.0% by weight of a vegetable oil, from about 20.0% by weight to about 80.0% by weight of a microemulsion forming surfactant, from about 10.0% by weight to about 70.0% by weight of a polysiloxane, and from about 5.0% by weight to about 50.0% by weight of a skin humectant;

(i) from about 5.0% by weight to about 35.0% by weight of a long chain hydrocarbon, from about 20.0% by weight to about 80.0% by weight of a microemulsion forming surfactant, from about 10.0% by weight to about 70.0% by weight of a polysiloxane, and from abbut 5.0% by weight to about 50.0% by weight of a skin humectant; and

(j) from about 5.0% by weight to about 35.0% by weight of a straight chain fatty ester, from about 20.0% by weight to about 80.0% by weight of a microemulsion forming surfactant, from about 10.0% by weight to about 70.0% by weight of a polysiloxane, and from about 5.0% by weight to about 50.0% by weight of a skin humectant and the composition having an average droplet size in the range of about 0.001 microns to about 0.2 microns in diameter, and wherein the composition is adapted to promote the penetration of the moisturizers into the skin.

4,797,274

COMPOSITION COMPRISING COPPER COMPOUND

Yoshiaki Miki, Yokohama, and Tsunehisa Ueda, Zushi, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1987, Ser. No. 89,178
Claims priority, application Japan, Aug. 26, 1986, 61-199568
Int. Cl.[4] A01N *37/42, 59/20;* **A61L** *9/01*
U.S. Cl. 424—76.1 **15 Claims**

1. A composition comprising a copper compound, and blended with it, (A) an L-ascorbic acid compound and/or an erythorbic acid compound and (B) an hydroxycarboxylic acid compound.

4,797,275

NICARBAZIN FEED PREMIX

Norman D. Brooks, Greenfield; Rebecca A. Kenyon, Indianapolis, and Peter W. Vanevenhoven, West Terre Haute, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1985, Ser. No. 780,352
Int. Cl.[4] A61K *31/74, 31/505*
U.S. Cl. 424—78 **11 Claims**

1. An animal feed premix in substantially granular and nondusty form comprising from about 5% to about 80% of finely powdered nicarbazin and polyethylene glycol with a molecular weight range of from about 3,000 to about 12,000.

4,797,276

COTTON BOLL WEEVIL, ALFALFA WEEVIL, AND CORN ROOTWORM VIA CONTACT WITH A STRAIN OF BACILLUS THURINGIENSIS

Corinna Herrnstadt, and George G. Soares, both of San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 714,790, Mar. 22, 1985, Pat. No. 4,764,372. This application Mar. 21, 1986, Ser. No. 842,529
Int. Cl.[4] C12P *21/00;* **C12R** *1/07;* **A01N** *63/00*
U.S. Cl. 424—84 **6 Claims**

1. A process, for controlling cotton boll weevil which comprises contacting the host plant of said cotton boll weevil with a cotton boll weevil-controlling effective amount of *Bacillus thuringiensis* strain *san diego*, having the identifying character-

istics of NRRL B-15939, or toxic crystals or spores from said strain.

2. A process, according to claim 1, which comprises incorporating said *Bacillus thuringiensis* strain *san diego*, or toxic crystals or spores TM from said strain, into a bait granule and placing said granule on or in the soil when planting seeds of cotton, or at later stages of the crop cycle.

4,797,277

METHOD FOR REPERFUSION THERAPY

Karl E. Arfors, del Mar, Calif., assignor to Pharmacia AB, Uppsala, Sweden

Filed Sep. 22, 1987, Ser. No. 99,403
Int. Cl.[4] A61K *39/00*
U.S. Cl. 424—85.8 7 Claims

1. Method for reperfusion therapy of a mammalian organ comprising the step of administering systemically to said organ a therapeutically active amount of an antibody preparation having specificity for a LAC-epitope that is responsible for leukocyte-endothelial cell adherence.

4,797,278

HYPOCHOLESTEROLEMICALLY AND/OR HYPOTRIGLYCERIDEMICALLY ACTIVE PRODUCTS AND THEIR USE

Yasuo Kawai, Atsugi; Kazunaga Yazawa, Sagamihara; Nobuo Suegara, Tsukui, and Hirotaka Shimohashi, Kodaira, all of Japan, assignors to Kabushiki Kaisya Advance Kalhatsu Kenkyujo, Tokyo, Japan

Division of Ser. No. 762,817, Aug. 5, 1985, Pat. No. 4,579,733, which is a continuation of Ser. No. 516,888, Jul. 25, 1983, abandoned. This application Jan. 14, 1986, Ser. No. 818,827
Claims priority, application Japan, Aug. 6, 1982, 57-136241
Int. Cl.[4] A61K *35/74*; C12N *1/20*; C12R *1/46*
U.S. Cl. 424—93 3 Claims

1. A method for lowering the serum cholesterol and/or triglyceride level of humans comprising orally administering to said humans a hypocholesterolemically or hypotriglyceridemically effective amount of living cells, dead cells, or a mixture thereof of a microorganism having the identifying characteristics of at least one strain selected from the group consisting of *Streptococcus faecium* FERM BP-296, *Streptococcus faecalis* FERM BP-297, *Streptococcus avium* FERM BP-298, *Streptococcus salivalius* FERM BP-299, *Streptococcus durans* FERM BP-300, *Streptococcus mitis* FERM BP-301, *Streptococcus equinus* FERM BP-302, and mutants thereof, and a pharmaceutically acceptable carrier therefor.

4,797,279

INSECTICIDAL HYBRID BACTERIA FROM *B.T. KURSTAKI* AND *B.T. TENEBRIONIS*

Dimitri Karamata, Epalinges, and Jean-Christophe Piot, Lausanne, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 28, 1986, Ser. No. 924,372
Claims priority, application United Kingdom, Oct. 30, 1985, 8526774
Int. Cl.[4] A61K *35/74*; A01N *63/00*; C12N *1/20*
U.S. Cl. 424—93 12 Claims

1. Hybriid *Bacillus thuringiensis cells caple of producing delta-endotoxin crystals typical for Bacillus thuringiensis kurstaki*, also capable fo producing delta-endotoxin crystals typical for *Bacillus thuringiensis tenebrionis* and having insecticidal activity against the larvae of *trichoplusia ni, Spodoptera littoralis* and *Phaedon cochlaeriae.*

9. The method of combatting insects which comprises applying to the insects or their habitat an insecticidally effective amount of a B.t. hybrid of claim 1.

4,797,280

ANTIBIOTICS PRODUCED BY *KIBDELOSPORANGIUM ARIDUM* SHEARER GEN. NOV., SP. NOV. ATCC 39323

Betty A. Bowie, Havertown; Richard D. Hedde, West Chester; Thomas O. Lindsey, Coatesville; David J. Newman, Wayne; Marcia C. Shearer, Conshohocken; Robert D. Sitrin, Plymouth Meeting, and Joseph R. Valenta, Strafford, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jun. 10, 1986, Ser. No. 872,717
Int. Cl.[4] A61K *35/74*
U.S. Cl. 424—118 6 Claims

1. A method for improving milk production in a lactating ruminant which comprises orally administering to the ruminant an effective amount of an enriched AAD 216 complex which at a pH of about 6 has the following characteristics:

(a) pale-white-yellow solid which decomposes at 300° to 350° C.;

(b) an approximate elemental composition of 53.22 percent carbon, 6.14 percent hydrogen, 3.73 percent nitrogen and 0.28 percent ash;

(c) an infrared spectrum in potassium bromide which exhibits peaks at the following wave numbers in cm^{-1}: 3400, 2920, 1660, 1600, 1410, 1460, 1430, 1390, 1320, 1240, 1150, 1060 and 1020;

(d) an ultraviolet spectrum in acetonitrile:water (1:1) which exhibits an absorption maximum at 280 nm under neutral and acid conditions with an $E_{1\%}=43.9$ and at 301 nm under basic conditions with an $E_{1\%}=56.8$;

(e) a positive reaction with periodate and negative reaction with ninhydrin; and

(f) soluble in H_2O, methanol, dimethylsulfoxide and dimethylformamide and insoluble in ethanol, acetonitrile, acetone, diethylether and aliphatic hydrocarbons.

4,797,281

PROCESS FOR PREPARING WOOD PRESERVATIVE COMPOSITIONS

Andrew D. J. Broome, Warrington, and Ian K. Egerton, Runcorn, both of England, assignors to Laporte Industries Limited, London, England

Filed Jan. 16, 1987, Ser. No. 3,741
Claims priority, application United Kingdom, Jan. 23, 1986, 8601570
Int. Cl.[4] A01N *59/22*
U.S. Cl. 424—133 8 Claims

1. A process for the production of a copper/chrome/arsenic wood preservative composition comprising mixing copper arsenate and alkali metal dichromate in an aqueous medium in the presence of an added acid selected from the group consisting of nitric acid, hydrochloric acid, sulphuric acid and formic acid effective to produce a pH in the aqueous medium below 0.05, thereby to produce a water-soluble product.

4,797,282

DRUG DEPOT CONTAINING CYTOSTATICS

Helmut Wahlig, Darmstadt, and Elvira Dingeldein, Dreieich, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,320
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3513938
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 21 Claims

1. A drug depot composition comprising a base of a polyacrylate or polymethacrylate, an amount of an amino acid effective to control the release of the drug from the composition and an effective amount of a cytostatic agent, wherein the amino acid is in the form of particles of a size less than 125 μm.

4,797,283

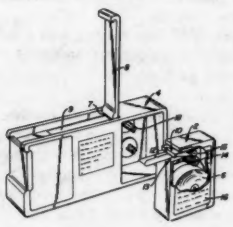
INTEGRATED DRUG DOSAGE FORM AND METERING SYSTEM

Jimmy D. Allen, Los Altos; Michael E. Cobb, San Jose; Robert S. Hillman, Cupertino; Dennis R. Musgall, Redwood City; Vladimir E. Ostoich, San Jose, and Gary H. Stroy, Los Altos, all of Calif., assignors to Biotrack, Incorporated, Mountain View, Calif.

Division of Ser. No. 798,780, Nov. 18, 1985, Pat. No. 4,712,460. This application Sep. 23, 1987, Ser. No. 100,123

Int. Cl.[4] A61K *9/70*

U.S. Cl. 424—443 11 Claims



1. An ingestable medicament tape, comprising:

about 10 to 40 weight % of a physiologically acceptable thermoplastic polymer selected from the group consisting of polyvinylpyriolidone, hydroxypropylmethylcellulose, and hydroxypropycellulose;

about 15 to 50 weight % of a polysaccharide;

about 5 to 40 weight % of a compatible physiologically acceptable plasticizer; and

about 0 to 20 weight % sorbitol;

said ingestable medicament tape being capable of being fed from a roller and cut at preselected lengths to provide a predetermined medicament dosage, having a tensile strength of at least 200 psi, and containing from 0.01 to 2 mg drug/mm^3.

4,797,284

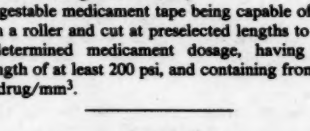
TRANSDERMAL DRUG DELIVERY SYSTEM

Alice E. Loper, Lederach, Pa., and Anup K. Majumdar, Eatontown, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 12, 1986, Ser. No. 838,852

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—449 12 Claims



1. A transdermal drug delivery system for administering a drug, chemically identifiable as (1α,2,3,4α,5,6-hexahydro-9-hydroxy-4-propyl-4H-naphth[1,2-b]-1,-oxazine, over an extended period comprising,

(a) a backing layer substantially impermeable to the drug and forming the top or outer surface of a bandage employing the delivery system,

(b) a resevoir layer comprising drug in a completely dissolved form in a continuous matrix of a carrier,

(c) a membrane layer comprising a structure exhibiting some rate controlling property,

wherein a substantially constant release rate is achieved over a substantial part of the wear period by the combined action of the reservoir layer and the membrane layer wherein:

$$\frac{h/KD_m}{x_{max}/D_r} \geqq \frac{(1-\beta\alpha)}{\beta\alpha} \quad (1)$$

and

$$\frac{(x_{max})^2}{(TD_r)} \geqq \frac{\beta\alpha}{(2\alpha-\beta\alpha-\beta\alpha^2)}\left[(1-\alpha)+\left(\frac{(1-\alpha)(2+2\alpha-3\beta\alpha-\beta\alpha^2)}{2-\beta\alpha}\right)^{\frac{1}{2}}\right] \quad (2)$$

are satisfied simultaneously, and wherein:

h is membrane thickness

K is partition coefficient between membrane and reservoir

D_m is diffusion coefficient of drug in membrane

x_{max} is reservoir thickness

D_r is diffusion coefficient of drug in reservoir

T is the desired wear time of the bandage,

α is a design parameter ranging from but not including 0 to and including 0.67, and representing the fractional drop in the theoretical flux from time zero to the end of the wear period T and

β is a design parameter ranging from but not including 0 to and including 1, which allows adjustments to shape of release profile, initial concentration, C_o, fraction of total drug depleted from the reservoir, h and x_{max}; and

$\geqq$ signifies equal to or greater than.

4,797,285

LIPOSOME/ANTHRAQUINONE DRUG COMPOSITION AND METHOD

Yechezkel Barenholz, Jerusalem, Israel, and Alberto Gabizon, San Francisco, Calif., assignors to Yissum Research and Development Company of the Hebrew University of Jerusalem and Hadassah Medical Organization, both of Jerusalem, Israel

Filed Dec. 6, 1985, Ser. No. 806,084

Int. Cl.[4] A61K *37/22;* A61J *5/00;* B01J *13/02;* B33B *5/16*

U.S. Cl. 424—450 5 Claims

1. A doxorubicin-containing liposome composition comprising

liposomes containing phosphatidylglycerol:phosphatidylcholine:cholesterol in a mole ratio of 3:7:4 and 1.5 mole percent alpha-tocopherol,

doxorubicin entrapped in the lipid bilayer region of the liposomes, and

ferrioxamine at a concentration of 50 μm.

4,797,286

ORALLY ADMINISTERABLE SUSTAINED RELEASE PHARMACEUTICAL FORMULATIONS

Arvind L. Thakkar, Indianapolis, and Lowell L. Gibson, Beech Grove, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 12, 1985, Ser. No. 797,305

Int. Cl.[4] A61K *9/64*

U.S. Cl. 424—456 2 Claims

1. A pharmaceutical formulation in capsule unit dosage form comprising a gelatin capsule containing a semi-solid matrix, said semi-solid matrix comprising an antibacterial agent, a pharmaceutically acceptable hydrophobic carrier matrix and a hydrophilic substance capable of creating channels in the hydrophobic carrier matrix thereby providing a sustained rate of release of the active agent from the formulation.

4,797,287

CYLINDRICAL MICROTABLETS

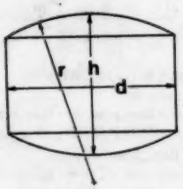
Claus H. Pich, and Thomas Moest, both of Moorrege, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 745,960, Jun. 18, 1985, abandoned. This application Apr. 30, 1987, Ser. No. 45,194

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422619; Jun. 19, 1984, 8418439

Int. Cl.[4] A61K 9/20

U.S. Cl. 424—464 2 Claims



1. A cylindrical pharmaceutical microtablet consisting essentially of pancreatin, said microtablet having a convex upper face and convex lower face, wherein the cylinder diameter and the height independently of one another are each from 1.0 to 2.5 mm, the ratio from the said diameter to the said height being from 1:0.5 to 1:1.5, and the radius of curvature r of the convex upper and lower faces of the cylindrical microtablet is from 0.6 to 1.5 times the diameter of the cylinder.

4,797,288

NOVEL DRUG DELIVERY SYSTEM

Shri C. Sharma, Mendham; James J. Shaw, Morristown, and Robert K. Yang, Morris Plains, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 658,101, Oct. 5, 1984, abandoned. This application Feb. 14, 1985, Ser. No. 701,470

Int. Cl.[4] A61K 9/46, 47/00

U.S. Cl. 424—476 14 Claims

1. A dry particulate drug delivery system designed to be chewed or swallowed whole comprising:

(A) cholestyramine in an amount of about 1% to about 75% and

(B) a hydrophobic matrix comprising

(i) about 0.5% to about 20% by weight of an emulsifier; and

(ii) about 61% to about 95% by weight of an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; and

(iii) at least one glyceride, wherein the cholestyramine and hydrophobic matrix form an agglomerate, and

(c) a coat effective to delay hydration until ingested comprising about 200% to baout 400% by weight of the agglomerate an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; wherein the coat forms a protective barrier effective to prevent unpleasant taste perception for the cholestyramine agglomerate.

4,797,289

ENHANCEMENT OF LACTOBACILLUS ACIDOPHILUS GROWTH AND VIABILITY IN YOGURT AND OTHER CULTURED DAIRY PRODUCTS

Malireddy S. Reddy, 6983 S. Telluride St., Aurora, Colo. 80016

Filed Mar. 9, 1987, Ser. No. 23,686

Int. Cl.[4] A23C 9/127, 9/133

U.S. Cl. 426—43 33 Claims

1. A method of making a cultured dairy product having a substantial quantity of viable *Lactobacillus acidophilus* microorganisms, said method comprising the steps of:

preparing a base mixture comprising milk;

pasteurizing or heat treating said base mixture;

cooling the base mixture;

inoculating the cooled base mixture with a culture of *Lactobacillus acidophilus* in a quantity sufficient to drop the pH to within the range of 6.0 to 6.3 to produce an acidophilus growing mixture;

incubating said acidophilus growing mixture until the pH drops wihtin the range of 6.0 to 6.3 to produce a substantial quantity of viable *Lactobacillus acidophilus* therein;

subsequently inoculating the acidophilus growing mixture with a starter culture specific to the cultured dairy product to produce a dairy product mix; and

incubating said dairy product mix to produce a cultured dairy product having a substantial viable content of *Lactobacillus acidophilus*.

4,797,290

LYOPHILIZED PROCESS FOR THE PRODUCTION OF A KEFIR YOGHURT

Sennosuke Tokumaru, 10-3, Tsujido Taiheidai 1, Fujisawa-shi, Kanagawa-ken; Michinori Kubo, Sakai, and Mari Nogami, Suita, all of Japan, assignors to Sennosuke Tokumaru, Kanagawa, Japan

Division of Ser. No. 914,835, Oct. 2, 1986, Pat. No. 4,702,923. This application Apr. 10, 1987, Ser. No. 36,935

Claims priority, application Japan, Oct. 8, 1985, 60-223987; Feb. 12, 1986, 61-26671

Int. Cl.[4] A23C 9/127, 1/08

U.S. Cl. 426—43 6 Claims

1. A process for the production of lyophilized kefir yoghurt obtained from milk with the use of Kefir fungi, said process comprising the steps of:

culturing kefir grain in pasteurized milk at a temperature of 20° to 25° C. for a sufficient time to produce a kefir starter,

preparing a cooled pasteurized milk or a pasteurized milk mixture, wherein the milk mixture is obtained by the step of combining fresh milk and at least one milk product; by heating the milk or milk mixture to a temperature of 60 to 70° C. under a pressure of 100 to 150 kg/cm, and then pasteurizing the heated milk or milk mixture at 85° to 95° C. for 5 to 30 minutes, and then cooling the pasteurized milk or pasteurized milk mixture to a temperature of 15° to 25° C. to obtain a cooled pasteurized milk or pasteurized milk mixture, culturing the kefir starter in the cooled pasteurized milk or pasteurized milk mixture at a temperature of 15° to 25° C. for 12 to 24 hours,

ripening the cultured kefir starter in the cooled pasteurized milk or pasteurized milk mixture for 5 to 20 hours at a temperature of 10° to 15° C. to produce kefir yoghurt to a temperature of, −25° to −35° C. to produce frozen kefir yoghurt, and

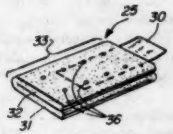
lyophilizing the forzen kefir yoghurt under a reduced pressure of 0.1 to 1.0 mmHg at a temperature of 35° to 40° C. to produce a lyophilized kefir yoghurt.

4,797,291

METHOD OF PREPARING A COMESTIBLE WITH INSERT

William W. Pierce, 3030 McKinney Ave., No. 802, Dallas, Tex. 75204; George June, Indianapolis, Ind.; James M. Meadows, Dallas, Tex., and Albert G. Cheek, Richmond, Ind., assignors to William W. Pierce, Chicago, Ill.

Filed Jul. 1, 1985, Ser. No. 750,593
Int. Cl.[4] A21D *8/04*; A23P *1/08*
U.S. Cl. 426—63 19 Claims



1. A method for making a comestible product comprising the following steps:

(A) forming food material into pairs of first and second sections with the first sections of said pairs arranged in substantially end-to-end alignment and with the second sections of said pairs arranged in substantially end-to-end alignment;

(B) positioning an insert article adjacent one of said first sections of a pair of said sections to locate a first portion of said insert article inwardly of some of said food material of said one first section to define peripheral regions which extend beyond said insert article and to locate a second portion of said insert article projecting beyond said one first section and onto an adjacent first section of an adjacent pair of sections;

(C) effecting relative movement between said two sections of each pair to rearrange said two sections in registration to contact each other at said peripheral regions and to contact the interposed insert article portions to substantially contain each said insert article first portion between said first and second sections of one pair of sections and to substantially contain each said insert article second portion between the first and second sections of an adjacent pair of sections;

(D) cooking said rearranged food material sections with said insert articles contained therein; and

(E) separating adjacent pairs of the rearranged and cooked sections whereby said second portion of each of said insert article is exposed in projecting relationship from one of said rearranged and cooked pairs of sections.

4,797,292

PROCESS FOR PREPARING AGGLOMERATES OF POTATO GRANULES

Johannes DeWit, Beauvais, France, assignor to Nestec S. A., Vevey, Switzerland

Filed Aug. 24, 1987, Ser. No. 88,947
Claims priority, application France, Sep. 26, 1986, 8613473
Int. Cl.[4] A23L *1/2165*
U.S. Cl. 426—285 7 Claims

1. A process for the agglomeration of potato granules comprising mixing 45 to 55 parts by weight of potato granules, 45 to 55 parts by weight of water and 2 to 3 parts dry matter by weight of egg white solids, passing the mixture through a 3 mm to 6 mm mesh sieve, drying the sieved mixture to a residual moisture content of from 1% to 10% and then crushing the dried mixture and obtaining agglomerates.

4,797,293

PROCESS FOR A NON-CLOUDING, CONCENTRATED TEA EXTRACT

David N. Evans, Englishtown; Charles L. Fairchild, East Windsor; Karl C. Kramer, Dunellen; John C. Spruill, Burlington County; Gerard J. Wansor, Mercer County, and Robert W. Wood, Cranbury, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jun. 9, 1987, Ser. No. 60,123
Int. Cl.[4] A23F *3/16*
U.S. Cl. 426—330.3 9 Claims

1. A method for producing a shelf-stable, non-clouding tea concentrate having a pH of from 3.9 to 4.3 consisting of the following steps:

(a) producing a deionized, aqueous tea concentrate having a tea solids level of from 8 to 24% by weight and a pH of from about 4.7 to 5.5, said concentrate being either a fresh brewed concentrate which is obtained by infusing tea leaf material with hot, deionized water or a reconstituted concentrate which is obtained by dissolving spray-dried tea solids in deionized water;

(b) adding food-acceptable acids to the aqueous tea concentrate of step (a) to reduce the pH to from 2.9 to 3.5;

(c) reducing the temperature of the reduced - pH concentrate of step (b) from 30° to 45° F. and holding said concentrate at this reduced temperature for at least one hour in the presence of a minimal amount of agitation in order to produce a precipitate;

(d) removing the precipitate from the concentrate of step (c) in order to clarify the concentrate, thereby resulting in a 5 to 20% reduction in the level of solids contained in the concentrate

(e) raising the pH of the clarified concentrate to a level of from 3.9 to 4.3 by the addition of food-approved alkaline materials; and, thereafter, (f) storing the concentrate at ambient temperature.

4,797,294

CHILLPROOFING WITH MAGNESIUM SILICATE/SILICA GEL AGENTS

Kenneth A. Berg, Norristown, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Filed Jun. 29, 1987, Ser. No. 67,022
Int. Cl.[4] C12H *1/02*
U.S. Cl. 426—330.4 8 Claims

4. A method of treating beer to prevent chill haze comprising the steps of:

a. contacting said beer with a sufficient amount of a combination of magnesium silicate and silica gel to remove chill haze components, said combination being 30 to 60% magnesium silicate and 70 to 40% silica gel;

b. maintaining said contact for a time sufficient to absorb the chill haze component; and

c. separating the combination from the beer.

4,797,295

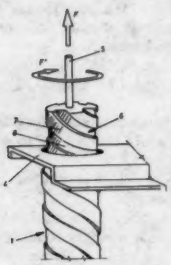
METHOD OF MAKING STICK-SUPPORTED MOLDED ICE CREAM WITH UNDERCUT PORTIONS

Grigoli Franco, and Trabacchi Franco, both of Milano, Italy, assignors to Sidam S.R.L., Cormano, Italy

Filed Jun. 1, 1987, Ser. No. 57,226
Claims priority, application Italy, Jun. 6, 1986, 20707 A/86
Int. Cl.[4] A23G *9/26*
U.S. Cl. 426—421 2 Claims

1. A method of making a stick-supported ice-cream comprising the steps of providing a single-piece rigid mold having on an internal surface thereof alternating internally raised and recessed threads, filling the rigid mold with an ice-cream in a liquid state, inserting a stick into said ice-cream, then solidifying said ice-cream in said mold to produce a stick-supported ice-cream having on the external surface thereof alternating externally raised and recessed threads and applying external

means to said stick and pulling upon said stick in an axial direction of said mold while allowing said stick to rotate such that said pulling action is assisted by a natural movement ex-



erted on said stick-supported ice-cream by virtue due to a cooperation between the threads of said mold and said stick-supported ice-cream so that said ice-cream is easily removed from the mold.

4,797,296

PISTON-CYCLINDER-ASSEMBLY FOR A COFFEE BREWING APPARATUS AND A METHOD OF ITS OPERATION

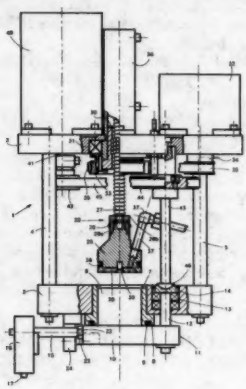
Hermann Meier, Musenweg, and Jean-Paul Franzolin, Au Floreal, both of Switzerland, assignors to Cafina AG, Hunzenschwil, Switzerland

Filed Feb. 24, 1987, Ser. No. 17,365

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607656

Int. Cl.[4] A23F *5/00*

U.S. Cl. 426—433 **14 Claims**



1. A piston-cylinder-assembly for use in a coffee brewing apparatus, comprising:

spaced first and second frame members;

a cylindric cavity formed in the second frame member, said cylindric cavity serving as a brewing chamber into which coffee powder to be scalded is filled, and having a first open end facing the first frame member and a second open end remote from said first frame member;

a piston member mounted on said first frame member coaxially with said cylindric cavity and displaceable axially toward and away from said cylindric cavity, said piston member comprising internal brewing water channels merging to the outside in the region of its front surface adjacent to said first open end of said cylindric cavity, and connected to a brewing water supply pipe;

first drive means mounted on said first frame member and operatively coupled to said piston member for displacing said piston member between a rest position in which the front surface of said piston member is spaced from said first open end of said cylindric cavity to permit access to said first open end, and an operative position in which the piston member closes said first open end of said cylindric cavity;

closing means mounted on said second frame member and displaceable between an operative position in which said closing means closes said second open end of said cylindric cavity, and a rest position in which said closing member does not hinder access to said second open end of said cylindric cavity, said closing means being fixed with respect to the central axis of said cylindric cavity;

second drive means operatively coupled to said closing means for displacing said closing means between said operative and rest positions;

said first drive means comprising an electric motor, gear means driven by said electric motor, and control means comprising a pressure sensor for sensing the pressure exerted by the front face of said piston member on the coffee powder in said cylindric cavity and for generating a stop signal to stop the operation of said electric motor when a preselected pressure is reached.

4,797,297

PROCESSING OF SUGAR CANE PRODUCT AND DRIED PRODUCT OBTAINED THEREFROM

Mark H. O'Sullivan, 32 Lambert Road, Indooroopilly, Queensland, Australia

Filed Aug. 27, 1986, Ser. No. 901,271

Claims priority, application Australia, Sep. 2, 1985, PH2229; Sep. 16, 1985, PH2446; Apr. 14, 1986, PH5446; Jun. 26, 1986, PH6562

Int. Cl.[4] A23L *1/10*

U.S. Cl. 426—483 **7 Claims**

1. A process for the separation of sugar cane into three fractions, one fraction of pieces containing substantially only fibrous sclerenchyma cells from the rind of the sugar cane, one fraction of pieces containing substantially only vascular bundles from the sugar cane, and one fraction of pieces containing substantially only non-fibrous parenchyma cells from the sugar cane, the process comprising the steps of:

(a) subjecting cut lengths of whole sugar cane to a disintegrating force in a disintegrating means to produce disintegrated sugar cane by inducing longitudinal and transverse severance of the lengths of sugar cane so as to cause a physical separation of the fibrous sclerenchyma cells and the vascular bundles from the non-fibrous parenchyma cells while preserving the fibrous nature of the sclerenchyma cells of the rind and of the vascular bundles and wherein substantially all of the pieces containing the sclerenchyma cells and the vascular bundles have a length greater than 2 cm;

(b) drying the disintegrated sugar cane by discharging the disintegrated sugar cane directly from the disintegrating means into a drying means containing a drying gas heated to a temperature of from 60° to 600° C., and maintaining and agitating the disintegrated sugar cane therein for an average residence time of from 0.1 to 20 second so that the moisture content of the disintegrated sugar cane is reduced to less than 20% by weight and the dried parenchyma cells deposit on or within the dried parenchyma cell walls substantially all of the dried sugar resulting from the evaporation of the contents of the natural parenchyma cells; and

(c) after the disintegrated sugar cane has been dried, separating the disintegrated sugar cane into the three aforementioned fractions.

4,797,298

BRANCHED AMIDES OF L-ASPARTYL-D-AMINO ACID DIPEPTIDES

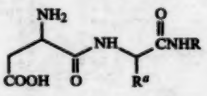
Thomas M. Brennan, Mountain View, Calif., and Michael E. Hendrick, Groton, Conn., assignors to Pfizer, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 496,428, May 20, 1983, which is a division of Ser. No. 201,745, Nov. 5, 1980, Pat. No. 4,411,925, which is a continuation-in-part of Ser. No. 113,800, Jan. 21, 1980, abandoned. This application Dec. 18, 1986, Ser. No. 944,269

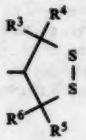
Int. Cl.[4] C07D 339/02; A23L 1/236

U.S. Cl. 426—548 12 Claims

1. An L-aspartyl-D-amino acid dipeptide amide of the formula



and the physiologically acceptable cationic and acid addition salts thereof, wherein R^a is methyl, hydroxymethyl, ethyl, n-propyl or isopropyl and R is



where at least one of R^3, R^4, R^5 and R^6 is alkyl having from one to four carbon atoms, the remainder are hydrogen or alkyl having from one to four carbon atoms, the sum of the carbon atoms in R^3,R^4, R^5 and R^6 is not greater than six; and when both of R^3 and R^4 or R^5 and R^6 are alkyl, they are methyl or ethyl.

4,797,299

LIGHT RECEIVING MEMBERS HAVING A-SI (GESN) PHOTOSENSITIVE LAYER AND A-SI (O,C,N) SURFACER LAYER ON A SUPPORT HAVING SPHERICAL DIMPLES WITH INSIDE FACES HAVING MINUTE IRREGULARITIES

Mitsuru Honda; Atsushi Kolke, both of Chiba; Kyosuke Ogawa, Miye, and Keiichi Murai, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1986, Ser. No. 924,448

Claims priority, application Japan, Nov. 1, 1985, 60-244142

Int. Cl.[4] G03G 5/085

U.S. Cl. 430—65 32 Claims

1. A light receiving member comprising a support and a light receiving layer constituted by a photosensitive layer and a surface layer having a free surface; said support having a surface provided with irregularities composed of spherical dimples, each of which dimples having an inside face provided with minute irregularities; said photosensitive layer being composed of amorphous material containing silicon atoms and at least one selected from the group consisting of germanium atoms and tin atoms; said surface layer being composed of amorphous material containing silicon atoms and at least one selected from the group consisting of oxygen atoms, carbon atoms and nitrogen atoms and not containing any germanium atoms or tin atoms; and wherein an optical band gap possessed by said surface layer and an optical band gap possessed by said photosensitive layer on which said surface layer is disposed are matched at an interface between the surface layer and the photosensitive layer.

4,797,300

COMPOSITIONS CONTAINING NOVEL SOLID, NONDIGESTIBLE, FAT-LIKE COMPOUNDS

Ronald J. Jandacek, Cincinnati, and James C. Letton, Forest Park, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Apr. 10, 1987, Ser. No. 36,836

Int. Cl.[4] A23D 5/00

U.S. Cl. 426—549 14 Claims

1. A shortening composition comprising from about 75% to about 90% of an edible oil having a complete melting point below about 37° C. and from about 10% to about 25% of a solid polyester of sucrose wherein the ester groups consist essentially of a mixture of short chain saturated fatty acid radicals containing from 2 to 10 carbon atoms and long chain saturated fatty acid radicals containing from 20 to 24 carbon atoms in a molar ratio of short chain to long chain fatty acid radicals of from about 3:5 to about 4:4, and wherein the degree of esterification is from about 7 to about 8.

4,797,301

METHOD OF AND APPARATUS FOR APPLYING A FLUID TO A BULK COMMODITY

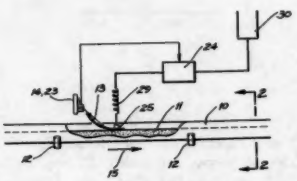
John H. Ardley, Neutral Bay; Brett A. Smith, Five Dock, and Alison W. Nicholls, Peasant Hills, all of Australia, assignors to Wellcome Australia Limited, Australia

Filed Sep. 18, 1987, Ser. No. 98,272

Claims priority, application Australia, Sep. 22, 1986, PH08142

Int. Cl.[4] B05D 1/02; B05C 11/00, 5/00; B05B 17/00

U.S. Cl. 427—8 9 Claims



1. An apparatus for applying a fluid by direct contact to a material which is carried by a conveyor, the apparatus comprising a flap device located adjacent the conveyor and positioned to continuously contact material carried by or discharged from the conveyor, a distributor extending across at least a portion of the width of the flap device and arranged in use of the apparatus to direct fluid into the material which is contacted by the flap device, means for delivering the fluid to the distributor, and means for sensing the existence of material on the conveyor and means for admitting the fluid to the distributor responsive to the sensing means sensing material present on the conveyor.

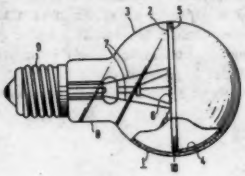
9. A method of applying a fluid to a bulk material which is carried by a conveyor, comprising conveying the bulk material, directing the fluid into the material by way of a distributor mounted to a pivotable flap device, the flap device being located adjacent the conveyor, contacting the material carried by or delivered from the conveyor with the flap device, sensing the material on the conveyor with the flap device, and delivering the fluid to the distributor responsive to the material being sensed by the flap device to be present on the conveyor.

4,797,302

ELECTRIC LAMP HAVING A MIRROR-COATED LAMP VESSEL

Johannes W. Ingeveld, and Albert J. Westerhof, both of Weert, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Division of Ser. No. 40,450, Apr. 16, 1987, Pat. No. 4,758,761.
This application Dec. 23, 1987, Ser. No. 137,047
Claims priority, application Netherlands, Apr. 16, 1986, 8600955
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—107 6 Claims



1. A method of forming a sharp boundary on an aluminum mirror coating in an electric lamp envelope, said method comprising:

(a) providing a lamp envelope having a transparent wall portion adjoining an aluminum mirror coated portion on it's inner surface, said mirror coated portion having a border region comprising a layer of aluminum thinner than said mirror coated portion; and

(b) heating said border region to convert the thinner layer of aluminum to a layer of substantially aluminum oxide for forming said boundary.

4,797,303

SURFACE LUBRICANTS FOR DISC RECORD

Duncan W. Frew, Alamo, and Robert P. Shadwick, San Jose, both of Calif., assignors to Unisys Corp., Detroit, Mich.

Filed Sep. 4, 1985, Ser. No. 772,966
Int. Cl.[4] B05D 5/12; B32B 27/00; G11B 5/72
U.S. Cl. 427—131 2 Claims

1. A method of over-coating a magnetic recording surface with fluoro-polymer "reactive-film" lube material including prescribed reactive terminations at both ends of a prescribed magnetic lube-like backbone.

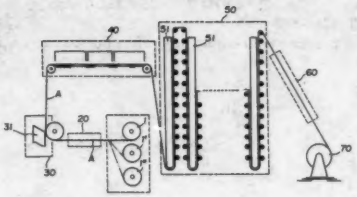
said surface being characterized by active hydroxyls, said method being characterized by selecting and treating said "reactive-film" lube materials, and applying them to said recording surface and creating a relatively scant, continuous uniform reacted-film of minimum thickness and characterized by di-bonding to active hydroxyls of this recording surface; selecting a surface-lube fluoropolymer structurally the same as, or similar to, the backbone of the "reactive-film" lube material, and applying this surface lube on the di-bonded "reactive-film" material, and allowing it to be attracted to the exposed backbone of the "reactive-film" lube material, the said di-bonding of the "reactive-film" lube material, together with affinity of the surface-lube to said backbone serving to provide superior resistance to lubricant spin-off and like depletion phenomena.

4,797,304

CONTINUOUS COATING METHOD CAPABLE OF ACHIEVING HIGHER YIELD

Tunezo Sugita, Odawara, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,603
Claims priority, application Japan, Mar. 18, 1986, 61-59899
Int. Cl.[4] B05D 5/10; G03C 1/495
U.S. Cl. 427—208.6 8 Claims



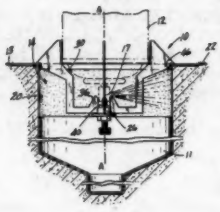
1. A method of applying a coating layer on at least one surface of an elongated support traveling continuously on rollers comprising providing said coating layer on said support, providing an adhesive layer on selected areas of at least one surface of said support in contact with at least some of said rollers, wherein some portions of said coating layer have no adhesive layer thereon and whereby substantially no adhesive from said adhesive layer is transferred onto a surface of any of said rollers.

4,797,305

PROCESS AND APPARATUS FOR PAINTING GOLF HOLES

John Schleicher, 46 Sperry Rd., Bethany, Conn. 06525

Filed Nov. 27, 1987, Ser. No. 125,885
Int. Cl.[4] B05D 1/02, 7/22
U.S. Cl. 427—236 11 Claims



*1. A process for spray painting a golf hole which comprises:

providing a can of spray paint having a valve assembly, a push button for operating said valve assembly, and a discharge opening in said button;

positioning a holder for said can having means for actuating said valve assembly over said hole;

inverting said can and inserting said inverted can into said holder so that said discharge opening lies a desired distance below the upper periphery of said hole;

pressing said push button against said valve assembly actuating means to initiate the flow of paint through said opening; and

rotating said can to paint the walls of said golf hole.

4,797,306

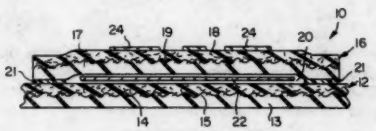
RADIENT HEAT RESISTANT STENCILIBLE INFLATABLE FABRIC AND METHOD

Lowell W. Roemke, Wadsworth, and Hildreth W. Stevenson, Medina, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio and The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 866,656, May 27, 1986, Pat. No. 4,719,138. This application Jul. 16, 1987, Ser. No. 74,110

Int. Cl.[4] B05D *1/36*

U.S. Cl. 427—261 5 Claims



1. A method for stenciling a radiant heat resistant inflatable structure formed of at least one ply of a structural fabric having an aluminum rich coating thereover comprising the steps of:

providing a spacer element upon the aluminum rich coating of the structural ply;

providing a surface ply having an outer surface including an aluminum rich coating thereover;

defining a cavity by adhering the edge portions of the surface ply to the structural ply in a manner encapsulating the spacer element between the structural and surface plies; and

stenciling the outer surface of the surface ply.

4,797,307

PROCESS FOR THE PREPARATION OF POLYIMIDE FILM

Akihiro Kunimoto; Seiichiro Takabayashi, and Yuji Matsui, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed May 14, 1987, Ser. No. 50,492

Claims priority, application Japan, May 15, 1986, 61-112277

Int. Cl.[4] B05D *3/02;* B29C *71/02*

U.S. Cl. 427—386 17 Claims

1. A process for the preparation of a polyimide film comprising the steps of:

evenly coating unto the surface of a solid film, a surface treating solution which contains at least one heat-resistant surface treating agent selected from the group consisting of aminosilane type, epoxysilane type and titanate type in an amount of not less than 0.5 wt. % and has a water content of not higher than 20 wt. %; said solid film being formed of an aromatic polymer composition which contains 100 parts by weight of an aromatic polyamic acid and 5–150 parts by weight of an organic polar solvent, said aromatic polyamic acid being produced by polymerization of an aromatic tetracarboxylic acid component and an aromatic diamine component in essentially equimolar amounts wherein the tetracarboxylic acid component contains a biphenyltetracarboxylic acid or a dianhydride thereof in an amount of not less than 60 mol % and the aromatic diamine component contains a phenylene diamine in an amount of not less than 50 mol %; and

heating said solid film having the coated surface treating solution thereon to a temperature of 100°–600° C. to imidize the polyamic acid constituting said solid film and simultaneously to dry said film.

4,797,308

SIMULATED MOTHER-OF-PEARL

Harry E. Mattin, Briarcliff Manor, N.Y., assignor to The Mearl Corporation, Ossining, N.Y.

Filed Jul. 6, 1987, Ser. No. 70,051

Int. Cl.[4] B32B *27/20*

U.S. Cl. 428—15 10 Claims

1. An irridescent, lustrous composite consisting of a transparent or translucent thermoplsastic resin pigmented with 0.5–10% of a metal oxide-coated mica pigment, said substrate carrying on at least one surface thereof a transparent thermoplastic resinous laminate film of at least 70 very thin and generally parallel layers of transparent thermoplastic resinous materials, the contiguous layers differing in refractive index by at least about 0.06, and in which the layer at each external surface has a thickness which is greater than the thickness of any one of said very thin layers and at least 5% of the total thickness of the film.

4,797,309

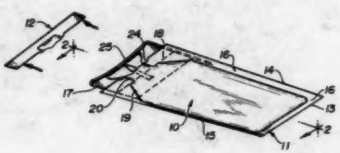
FOIL POUCH

Gene W. Kammerer, East Brunswick, and Donald Barcan, Maplewood, both of N.J., assignors to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

Filed Dec. 14, 1987, Ser. No. 133,596

Int. Cl.[4] B65D *47/10*

U.S. Cl. 428—35.3 4 Claims



1. A container for a viscous material comprising a pouch formed from two layers of a sealable thermoplastic metal foil laminate having two opposed side edges, a top edge and a bottom edge, the two laminates being sealed at the side edges and the top and bottom edges to form the pouch, a neck adjacent the seal at the top edge of the pouch, a portion of said neck intersecting with tear lines which extend in a substantially straight line from each side edge of the container toward the center of the container, a tear line extension at the end of the straight line portion of the tear lines extending at an angle of from 15° to 90° towards the bottom edge of the container, a spreader secured to one surface of the pouch, said spreader having an arcuate edge, said spreader being secured to said pouch so that the arcuate edge is positioned between the tear line and the top edge of the unopened pouch.

4,797,310

SUBSTRATE CARRYING A POROUS POLYMERIC MATERIAL

Donald Barby, Chester, and Zia Haq, Merseyside, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,046

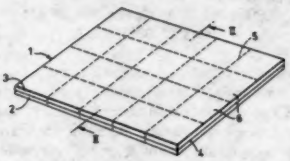
Claims priority, application United Kingdom, Jun. 26, 1981, 8119739

Int. Cl.[4] C08J *9/28*

U.S. Cl. 428—71 17 Claims

1. An article suitable for delivering liquid, said article comprising a flexible liquid-permeable substrate carrying a pressure-sensitive porous polymeric material capable of retaining

at least 5 times its own weight, defined in terms of water, of liquid and of releasing at least some of said liquid on the application thereto of hand pressure, the porous polymeric material containing an aqueous or non-aqueous liquid.



4,797,311

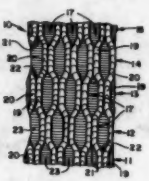
INSULATING FABRIC AND METHOD OF MANUFACTURE THEREOF

Philip Kemp, Closter, N.J., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.

Continuation of Ser. No. 59,576, Jun. 8, 1987, Pat. No. 4,771,614, which is a continuation-in-part of Ser. No. 823,674, Jan. 29, 1986, Pat. No. 4,678,693. This application Mar. 18, 1988, Ser. No. 170,306

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—92 **16 Claims**



1. An insulating fabric having an inner fabric face of soft texture formed of a bulk yarn and an outer fabric face formed of a combined synthetic and cotton yarn, said insulating fabric being characterized by an increase in thickness as the result of plural washings to enhance its heat insulating quality and comprising

(a) a base fabric constituted of a 2×1 rib knitted thermal fabric having air-entrapping cells,

(b) said base fabric being knitted of a bulk yarn in selected courses and being knitted of a combined synthetic and cotton yarn in courses intevening between the selected courses,

(c) the combined synthetic and cotton yarn forming a knitted framework for anchoring and stabilizing the bulk yarn in the fabric, and

(d) the combined synthetic and cotton yarn being formed into tuck loops in spaced courses and spaced wales of the fabric.

4,797,312

FOAM-HONEYCOMB ARTICLE AND METHOD

Kent Sherwood, 2612 Highland Ave., Santa Monica, Calif. 90405

Filed Sep. 30, 1987, Ser. No. 103,449

Int. Cl.[4] B32B *1/04, 3/02;* A63C *15/05*

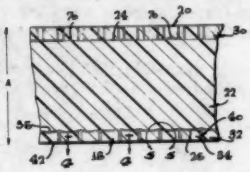
U.S. Cl. 428—117 **9 Claims**

1. A surface-reinforced article, comprising:

a core of foam material having a first outer side;

a surface region of said article which includes a porous but flow-through resistant first layer lying on said outer side of said core, a multi-cell honeycomb-type sheet structure lying outside said first layer and a fibrous third layer lying outside said honeycomb-type structure;

said first layer, said cells of said honeycomb-type sheet structure, and said fibrous third layer each being impregnated with the same foam material as said core, and the foam material in said core, first layer, cells, and third layer is of the same composition throughout.



4,797,313

NON-METALLIC POLYMERIC TWIST TIE

Richard D. Stolk, Manchester, and Vladimir O. Bekker, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 8, 1985, Ser. No. 796,662

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—156 **18 Claims**

1. A wireless twist tie adapted to be twisted from a ribbon into a fastly holding closure comprising polymeric material exhibiting a glass transition temperature greater than about 30° C. and exhibiting glass/rubber transitional behavior in a temperature range from about 10° C. to about 40° C., wherein, when said twist tie is deformed under tensile stress at 25° C. at a strain rate between 0.1 and 0.5 inches per inch per minute, said twist tie exhibits yield at a stress between about 500 and 9,000 psi, said material comprising polyethylene terephthalate and particulate rubber impact modifier.

4,797,314

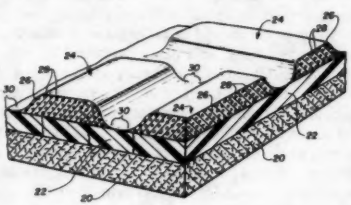
SURFACE COVERING PRODUCT

Raymond G. Davey, Lancaster, and Martin Dees, Jr., Landisville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Nov. 27, 1987, Ser. No. 127,036

Int. Cl.[4] B05D *5/06*

U.S. Cl. 428—167 **11 Claims**



1. A surface covering product comprising:

(a) a substrate material,

(b) an impervious coating bonded to at least one surface of said substrate material, and

(c) raised elements having a thickness between about 0.003 inch and 0.080 inch selectively arranged in a space pattern upon said coating, comprising a thixotropic plastic containing particles of solid material, wherein said thixotropic plastic contains at least one thixotrope chosen from the group consisting of fumed silicas, precipitated silicas, finely powdered organophilic clays, highly substituted sorbatols and calcium/organic complexes.

4,797,315

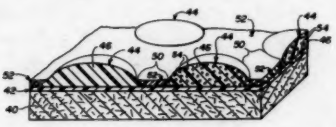
DECORATIVE SURFACE COVERINGS WITH DOT PATTERNS

Richard H. Balmer, Manheim, and Barbara A. Pfeiffer-Meshaw, Gordonville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 59,518, Jun. 8, 1987, abandoned. This application Dec. 30, 1987, Ser. No. 139,768

Int. Cl.[4] B05D 5/06

U.S. Cl. 428—167 14 Claims



1. A decorative surface covering product comprising:

(a) a substrate;

(b) a first impervious layer of a synthetic plastic polymeric material, said layer bonded to at least one surface of said substrate;

(c) a second layer partially covering said first layer, said second layer comprising discrete raised portions of a cured thixotropic plastic material forming raised elements extending upwardly therefrom with depressed areas around the raised elements; and

(d) a third layer filling in part of the depressed areas whereby the raised elements and third layer form a colored dot pattern on a contrasting colored background.

4,797,316

ETCHED GLASS AND PROCESS OF MANUFACTURING SAME

André Hecq, Nalinnes, and René Ledroit, Les Bons Villers, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Dec. 4, 1987, Ser. No. 129,962

Claims priority, application Luxembourg, Dec. 23, 1986, 86722

Int. Cl.[4] B32B 3/28; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 428—167 57 Claims

1. An article comprising a glass sheet and having an etched pattern, characterised in that said glass sheet is a chemically tempered glass sheet, and the pattern comprises one or more grooves etched into the article using fluorine ions to a depth of less than 2 μm.

4,797,317

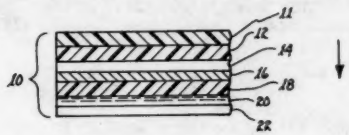
SOLAR CONTROL WINDOW FILM

Dell B. Oliver, Gilbert, and Peter Jahoda, Chandler, both of Ariz., assignors to Gila River Products, Inc., Chandler, Ariz.

Continuation of Ser. No. 655,336, Sep. 27, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,513

Int. Cl.[4] B32B 5/14, 7/02

U.S. Cl. 428—204 10 Claims



1. A flexible, solar control, composite sheet for use on the inside surface of a motor vehicle window comprising:

(a) a first polymeric stratum having a high density layer applied by conventional vacuum deposition to a just surface, at least a portion of said high density layer having a density great enough to reduce the visible light transmission value to less than about 45% and the reflectance of visible light to no more than about 35%, said high density layer being a substance selected from the group consisting of nickel, chromium, alloys of nickel and/or chromium, stainless steel, and aluminum oxide;

(b) a second polymeric, dye-treated stratum bonded to the said first surface of said first polymeric stratum, and having light transmission values from about 35% to 70%; and

(c) means for adhering said first polymeric stratum to the inside surface of a motor vehicle window.

4,797,318

ACTIVE PARTICLE-CONTAINING NONWOVEN MATERIAL, METHOD OF FORMATION THEREOF, AND USES THEREOF

Ronald W. Brooker, Atlanta; Bernard Cohen, Duluth, and David M. Jackson, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 31, 1986, Ser. No. 892,529

Int. Cl.[4] D04H 1/58

U.S. Cl. 428—283 13 Claims

1. A substantially non-dusting nonwoven material comprising:

a web of meltblown fibers having a diameter of from less than about 1 micron to about 25 microns, said fibers comprising a blend of a polyolefin and from about 5% to about 30%, by weight, of an adhesive polymer selected from the group consisting of polybutylene and polyethylene acrylic acid; and

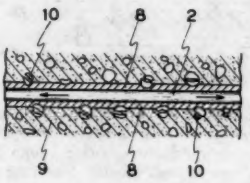
up to about 35%, by weight, based on the weight of the nonwoven material, of unblocked active particles, ranging in size from about 50 to about 150 microns, adhered to the surface of said fibers and distributed throughout said web.

4,797,319

GLAZED CEMENT PRODUCT AND METHOD FOR MANUFACTURING THEREOF

Shigeo Yoshida, Shiga; Satoshi Kitagawa, Yokaichi; Shozo Harada, Handa; Tetsuya Koide, Nagoya, and Manabu Hasegawa, Chita, all of Japan, assignors to National House Industrial Co., Ltd., Osaka and INAX Corporation, Aichi, both of, Japan

Filed Jan. 6, 1986, Ser. No. 816,533
Claims priority, application Japan, Jan. 29, 1985, 60-16103
Int. Cl.[4] B29C *39/10, 67/12;* B32B *13/04;* C04B *7/02*
U.S. Cl. 428—312.4 12 Claims



1. A method of manufacturing a glazed cement product comprising the steps in sequence of:
(a) preparing a kneaded mixture of cement,
(b) pouring the resulting kneaded mixture into a form or on a bed wherein reinforcing steel is laid,
(c) molding a molded body of the cement,
(d) curing the molded body of cement,
(e) applying a glaze onto a surface of the cured molded body of cement,
(f) burning the glazed molded body of cement,
(g) cooling the burned molded body of cement,
(h) hydrating to harden the cooled molded body of cement, wherein the action of generating cracks while burning and cooling, which is caused by the difference between the coefficient of thermal expansion between the reinforcing steel and a portion of the cement material, is absorbed by a stress absorbing portion around the reinforcing steel, the stress absorbing portion comprising a stress absorbing layer of pearlite power mortar coated on the reinforcing steel; and a reaction of an unreacted cement component is promoted by the hydration to harden for recovering mechanical strength.

4,797,320

COMPOSITE PLASTIC MOLDINGS AND A PROCESS FOR THEIR PRODUCTION

Richard Kopp, Cologne; Gerhard Grögler, Leverkusen; Heinrich Hess, Leverkusen; Hermann Schäfer, Leverkusen, and Werner Rasshofer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 140,468
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700572
Int. Cl.[4] B29C *67/20;* B32B *3/26*
U.S. Cl. 428—316.6 16 Claims

1. A composite plastic molding made up of a plastic foam having a polyurethane skin produced by heating a reactive one-component system composed of
(a) a finely divided polyisocyanate in which from 0.1 to 25 equivalent percent of the isocyanate groups have been deactivated and
(b) a polyamine and/or polyol having a molecular weight of from 400 to 8000
to form the polyurethane skin and joining the plastic foam to the polyurethane skin.

7. The molding of claim 1 in which the polyurethane skin is foamed.

4,797,321

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Teruhisa Miyata, Kyoto; Kenichi Inoue, Muko; Akira Miyake, Kyoto, and Kohji Norimatsu, Fukuchiyama, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 15, 1986, Ser. No. 918,973
Claims priority, application Japan, Oct. 15, 1985, 60-230575
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—328 17 Claims

1. A magnetc recording disc which comprises:
a non-magnetic support and
a magnetic layer provided on at least one surface of said support, wherein said magnetic layer has a thickness r of from 0.3 to 0.9 microns and comprises
magnetic powder,
a resinous binder,
polishing particles having a Mohs' scale of hardness of not less than 7 and an average particle size of from 0.40 r to 0.65 r, wherein r is the thickness in microns of said magnetic layer, and
a lubricating agent having a melting point of not higher than 10° C. which comprises a fatty acid ester selected from the group consisting of n-butyl oleate, hexyl oleate, n-octyl oleate, 2-ethylhexyl oleate oleyl oleate, n-butyl laurate, heptyl laurate, n-butyl myristate, n-butoxyehtyl oleate, and trimethylopropane trioleate.

4,797,322

NOVEL ADHESIVES

Elwyn Huddleston, Franklin, and Karen C. Long, Bowling Green, both of Ky., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 30, 1987, Ser. No. 126,432
Int. Cl.[4] B32B *25/08*
U.S. Cl. 428—355 6 Claims

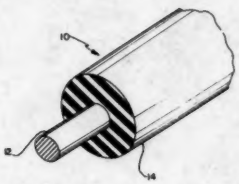
1. An adhesive tape characterized as possessing resistance to degradative environmental forces of ultraviolet light and oxidation, as being tacky to the feel, as having good shear resistance, and as being cost-effective, said tape comprising a support carrying on one or both surfaces thereof a layer of adhesive including an elastomer composition comprising:
(1) at least 30 percent by weight of a triblock terpolymer elastomer having polystrene end blocks and rubbery poly-(ethelyene-butylene) midblocks;
(2) at least 10 percent by weight of a diblock copolymer elastomer of styrene and ethylene-butylene; and
(3) at least 30 percent by weight of a non-liquid polyisobutylene or a copolymer containing at least 95 percent by weight of isobutylene; said adhesive composition further including about 80 to about 150 parts by weight of resin for each 100 parts by weight of rubber components of at least one tackifying resin possessing minimal unstaturated hydrocarbon groups, said resin being selected from the group consisting of saturated hydrocarbon, beta-terpene, hydrocarbon ester and pinene tackifying resins.

4,797,323

FLAME RETARDANT WIRE WITH HIGH INSULATION RESISTANCE

Alexander F. Wu, Bridgeport, Conn., and Robert B. Walters, Morrison, Colo., assignors to Vulkor, Incorporated, Lowell, Mass.

Division of Ser. No. 578,729, Feb. 9, 1984, abandoned, which is a continuation of Ser. No. 315,339, Oct. 26, 1981, abandoned.
This application Feb. 19, 1985, Ser. No. 703,057
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—389 26 Claims



1. A cable coated with a crosslinkable composition having suitable properties for an insulation material, which comprises a polyolefin, a reactive silicone fluid, from 5 to 80 parts by weight of a bromine-containing flame retardant agent, from 0.5 to 15 parts by weight of a zinc salt of mercaptoimidazole, and from 0.5 to 15 parts by weight of a sterically hindered ditertiary butyl phenol, these amounts being for each 100 parts by weight of the polyolefin.

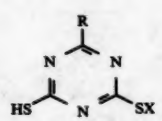
4,797,324

MAGNETIC RECORDING MEDIUM

Kotaro Hata, Ichikawa, Japan, assignor to Nippon Zeon Company, Ltd, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,255
Claims priority, application Japan, Feb. 7, 1987, 62-26792
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—411.1 16 Claims

1. A magnetic recording medium comprising a substrate and a magnetic layer formed on at least one surface of the substrate, wherein the magnetic layer is constituted of a magnetic powder and a binder which contains an epoxy-containing vinyl chloride resin and a triazinethiol compound, said triazinethiol compound being at least one compound selected from the group consisting of those represented by the general formula:



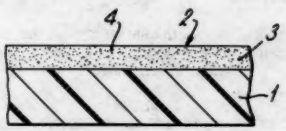
wherein X is a hydrogen atom, an alkali or alkaline earth metal and R is $OR_1)SR_1$ or NR_1R_2 (wherein R_1 and R_2 are each a hydrogen atom or a hydrocarbyl group having 1 to 20 carbon atoms, which may be substituted, or alternatively, R_1 and R_2 may be interconnected to form a ring), and the amount of said triazinethiol compound being 0.1 to 20 parts by weight per 100 parts by weight of the magnetic powder.

4,797,325

SPACECRAFT MATERIALS

Derek Verdin, Wantage, and Michael J. Duck, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 10, 1985, Ser. No. 807,465
Claims priority, application United Kingdom, Dec. 13, 1984, 8431518
Int. Cl.[4] B32B *27/00;* B05D *3/02;* B64C *1/00*
U.S. Cl. 428—473.5 19 Claims



5. A dielectric material according to claim 1 wherein the thickness of the surface layer lies between one and one hundred micrometres.

4,797,326

SUPPORTED POLYCRYSTALLINE COMPACTS

Frank J. Csillag, The Woodlands, Tex., assignor to The General Electric Company, Worthington, Ohio

Filed Jan. 14, 1986, Ser. No. 818,850
Int. Cl.[4] B22F *7/08*
U.S. Cl. 428—552 20 Claims

1. A process for fabricating a supported polycrystalline diamond or CBN compact which comprises:

(a) forming a sintered polycrystalline diamond or CBN compact having a surface;

(b) separately forming a plastically deformable support having a support surface;

(c) mating said diamond or CBN compact and said support at their respective surfaces;

(d) subjecting said mated diamond or CBN compact and said support to elevated temperature and pressure conditions sufficient to plastically deform said support surface into attachment with said compact surface, said temperature, pressure and the time of application thereof being inadequate to cause substantial degradation of said diamond or CBN compact; and

(e) recovering the resulting supported compact.

4,797,327

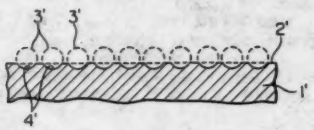
SURFACE TREATED METAL MEMBER, PREPARATION METHOD THEREOF AND PHOTOCONDUCTIVE MEMBER BY USE THEREOF

Mitsuru Honda, Kashiwa; Tetsuo Sueda, Chofu; Keiichi Murai, Kashiwa, and Kyosuke Ogawa, Nabari, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 847,449, Apr. 3, 1986, Pat. No. 4,735,883.
This application Jul. 17, 1987, Ser. No. 74,890
Claims priority, application Japan, Apr. 6, 1985, 60-73171; May 8, 1985, 60-98601; May 8, 1985, 60-98602; May 8, 1985, 60-98603
Int. Cl.[4] G03G *15/00*
U.S. Cl. 428—600 6 Claims

1. A surface treated metal member comprising an electro-

photographic layer support having a plurality of spherical mark impressions thereon, said impressions having a radius of



curvature R and a width D satisfying the relationship $0.035 \leqq D/R$, wherein D is 500 μm or less.

4,797,328

SOFT-SOLDER ALLOY FOR BONDING CERAMIC ARTICLES

Wolfgang Boehm, Alzenau-Albstadt; Juergen Hausselt, Langenselbold; Wolfgang Weise, Frankfurt am Main, and Willi Malikowsik, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,259

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605170

Int. Cl.[4] B32B *15/01, 15/04;* C22C *11/00, 13/00*

U.S. Cl. 428—621 14 Claims

1. A soft-solder alloy for bonding ceramic parts together for bonding a ceramic part to a metallic part consisting of 86 to 99% lead, 0 to 13% silver, 0 to 10% indium and 1 to 10% of a member selected from the group consisting of titanium, zirconium, and mixtures thereof.

4,797,329

OXIDATION RESISTANT FERROUS BASE FOIL

Farrell M. Kilbane, Centerville, and F. Curtiss Dunbar, West Chester, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Division of Ser. No. 741,282, Jun. 4, 1985, Pat. No. 4,686,155. This application May 8, 1987, Ser. No. 47,892

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] B01J *21/02*

U.S. Cl. 428—623 4 Claims

1. A monolithic support structure for catalytic converters for internal combustion engine exhaust systems, comprising an aluminum coated ferrous base metal foil having a thickness not greater than 0.13 mm formed by cold reduction of a hot dip substantially pure aluminum coated ferritic base metal strip containing from 10% to about 35% by weight chromium, up to 3% aluminum, up to 1% silicon, and balance essentially iron, said ferritic base metal strip having a thickness of at least 0.25 mm and an aluminum coating thickness ranging from 0.013 to 0.13 mm on each side, said coated foil having a ratio of total aluminum coating thickness to base metal foil thickness of at least 1:10, with at least 4% by weight total aluminum in said coated foil, said coated foil being further provided with an aluminum oxide layer on each side ranging in thickness from about 500 to about 10,000 angstroms, and a washcoat of a heat resistant, ceramic catalyst support material.

4,797,330

PERPENDICULAR MAGNETIC STORAGE MEDIUM

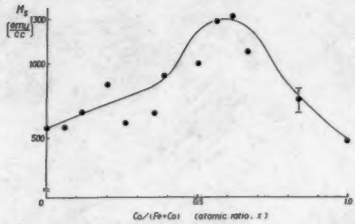
Shogo Nasu, Kobe, and Koji Saiki, Toyonaka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1987, Ser. No. 23,039

Claims priority, application Japan, Mar. 18, 1986, 61-60184; Sep. 22, 1986, 61-224214

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—694 6 Claims



1. A perpendicular magnetic storage medium comprising a substrate and a perpendicular magnetic anisotropic film formed on the substrate, characterized in that the perpendicular magnetic anisotropic film is a film consisting of a sub-oxide of a metal having a composition which is described by a general formula $[(Fe_{1-x}Co_x)_{1-y}M_y]_{1-z}O_z$, wherein $0.01 \leqq x \leqq 0.75$, $0.001 \leqq y \leqq 0.30$, $0.05 \leqq z \leqq 0.50$ and M means at least one metal selected from the group consisting of Al, Cr, Mo, Ti and Zr, wherein the concentration of M at the surface of the film is more than 1 atom %; said film having an easy magnetization axis perpendicular to the plane of the film and an X-ray diffraction spectrum having both a peak of diffracted X-ray intensity caused by oxidized Fe and a peak of diffracted X-ray intensity caused by metal state Fe and Co and M.

4,797,331

MAGNETO-OPTICAL RECORDING MATERIAL

Atsuyuki Watada, Numazu, and Fumiya Ohmi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

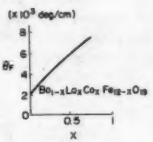
Filed Nov. 10, 1986, Ser. No. 928,378

Claims priority, application Japan, Nov. 19, 1985, 60-259384

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] G11B *7/24*

U.S. Cl. 428—694 6 Claims



1. A magneto-optical recording material consisting of magnetoplumbite type ferrite containing barium in which part of Ba is replaced by La and part of Fe is replaced by Co, wherein said barium magnetoplumbite type ferrite has the following formula:

$$Ba_{1-x}La_xCo_yFe_{12-y}O_{19}$$

wherein $0<x<1$, $x=y$;
or has the following formula:

$$Ba_{1-x}La_xCo_yFe_{12-(y+z)}O_{19}$$

wherein $0<x<1$, $0<z<6$, M_I represents a metal element having 4, 5 or 6 valences, wherein when M_I is a 4-valence metal element, $y=x+z$, when M_I is a 5-valence metal element, $y=x+2z$, and when M_I is a 6-valence metal element, $y=x+3z$; or has the following formula:

$$Ba_{1-x}La_xCo_yM_{I_z}M_{II_u}Fe_{12-(y+z+u)}O_{19}$$

wherein $0<x<1$, $0<z<6$, M_I represents a metal element having 4, 5 or 6 valences, and M_{II} represents a metal element having 3 valences, wherein when M_I is a 4-valence metal element, $y=x+z$, when M_I is a 5-valence metal element, $y=x+2z$, and when M_I is a 6-valence metal element, $y=x+3z$.

4,797,332

METHOD OF PREPARING CERAMIC SURFACES FOR WETTING THEREOF BY ALKALI METALS

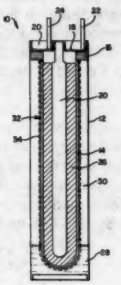
Peter Barrow, Alvaston, and Michael L. Wright, Allestree, both of England, assignors to Lilliwyte Societe Anouyme, Luxembourg

Filed Sep. 16, 1987, Ser. No. 97,521

Claims priority, application United Kingdom, Sep. 25, 1986, 8623071

Int. Cl.[4] H01M *10/39*

U.S. Cl. 429—104 **12 Claims**



1. A method of preparing a surface of a ceramic solid electrolyte conductor of alkali metal ions for wetting, in molten form, by the alkali metal whose ions are conducted by the ceramic, which method comprises doping the ceramic surface with an oxide of a transition metal.

4,797,333

ELECTROCHEMICAL CELL

Johan Coetzer, Pretoria, and Roger J. Wedlake, Johannesburg, both of South Africa, assignors to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg

Filed Jun. 2, 1987, Ser. No. 57,368

Claims priority, application United Kingdom, Jun. 6, 1986, 8613800

Int. Cl.[4] H01M *6/00, 10/44*

U.S. Cl. 429—103 **30 Claims**

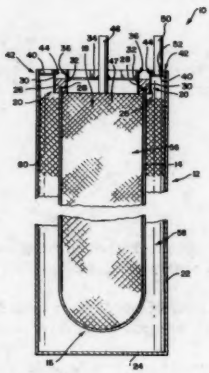
1. A method of making an electrochemical cell of the type comprising an anode compartment containing, at the operating temperature of the cell and when the cell is in its discharged state, a molten alkali metal anode, and a cathode compartment containing, at said operating temperature and in said discharged state, an alkali metal aluminium halide molten salt electrolyte which is also molten at the operating temperature of the cell, and having the formula $MAlHal_4$ wherein M is the alkali metal of the anode and Hal is a halide, the cathode compartment containing also a cathode which comprises an electronically conductive electrolyte-permeable matrix which has dispersed therein an active cathode substance which includes a transition metal T selected from the group comprising Fe, Ni, Co, Cr, Mn and mixtures thereof, the matrix being impregnated with said electrolyte, and, separating the anode compartment from the cathode compartment, a separator which comprises a solid conductor of the ions of the alkali metal of the anode or a micromolecular sieve which contains said alkali metal sorbed therein, which method comprises loading, into a cathode compartment of a cell housing comprising an anode compartment separated from a cathode compartment by a separator which is a solid conductor of ions of alkali metal M or is a micromolecular sieve which contains alkali metal M sorbed therein,

a matrix precursor, capable of becoming an electronically conductive electrolyte-permeable matrix on the cell being subjected to at least one charge cycle;

an alkali metal aluminium halide molten salt electrolyte having the formula $MAlHal_4$ wherein M is the alkali metal of the separator and Hal is a halide;

an alkali metal halide MHal wherein M and Hal are respectively the same alkali metal and halide as in the molten salt electrolyte;

aluminium; and



an active cathode substance which includes a transition metal T selected from the group consisting Fe, Ni, Co, Cr, Mn and mixtures thereof,

thereby to make an electrochemical cell precursor wherein, when it is subjected to charging at a temperature at which the molten salt electrolyte and alkali metal M are molten, aluminium reacts with the alkali metal halide MHal to produce further said molten salt electrolyte and to form said alkali metal M, the alkali metal M passing through the separator into the anode compartment; and

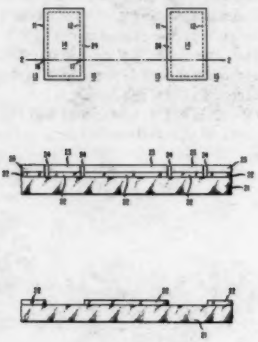
after all the aluminium has reacted with the alkali metal halide to provide a cell in a discharged state, the active cathode substance is halogenated, with further alkali metal M being produced and passing through the separator into the anode compartment, the proportions of alkali metal halide MHal, molten salt electrolyte and aluminium loaded into the cathode compartment being selected so that when the cell is fully charged and all the available active cathode substance has been halogenated, the proportion of alkali metal ions and aluminium ions in the electrolyte is such that the solubility of the active cathode substance in the molten electrolyte is at or near its minimum.

4,797,334

PATTERNING OPTICAL AND X-RAY MASKS FOR INTEGRATED CIRCUIT FABRICATION

William B. Glendinning, Red Bank, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1987, Ser. No. 133,582
Int. Cl.[4] G03F *1/00*
U.S. Cl. 430—5 10 Claims



1. A method of lithographic patterning of integrated circuit chip process mask plates and mask membranes comprising the steps of:

applying a thin layer of metal over a mask substrate;

covering the layer of metal with a layer of positive electron resist;

delineating the peripheral boundaries of the desired mask geometry using a direct-write spot electron beam;

said electron beam serving to expose the resist in the peripheral boundaries delineated by said electron beam;

developing and etching the mask substrate to remove the positive resist and the underlying metal in the exposed peripheral boundaries;

raster scanning the mask substrate with a low exposure-level intensity beam until a peripheral boundary is detected, the detection then serving to increase the beam intensity six or more times so as to expose the high intensity raster scanned positive resist;

said scanning and high intensity exposure continuing until the mating peripheral boundary is detected, the latter detection then serving to rapidly decrease the beam intensity to its former low exposure-level intensity;

developing the substrate to remove the positive resist subjected to the increased exposure-level beam intensity;

etching away the metal underlying the positive resist that was subject to said exposure-level beam intensity; and

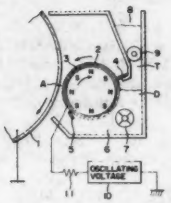
removing the remaining positive electron resist covering the substrate area outside of the geometry(s) circumscribed or delineated by said peripheral boundaries, said detection having an intrinsic delay so that the increase and decrease in beam intensity occurs a short predetermined time after a boundary has been encountered.

4,797,335

DEVELOPING METHOD FOR ELECTROSTATIC IMAGES USING COMPOSITE COMPONENT DEVELOPER UNDER NON-CONTACTING CONDITIONS

Seiichiro Hiratsuka; Satoshi Haneda, and Hisashi Shoji, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 859,859, May 1, 1986, abandoned, which is a continuation of Ser. No. 634,976, Jul. 27, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 96,818
Claims priority, application Japan, Aug. 5, 1983, 58-142597; Aug. 10, 1983, 58-145031
Int. Cl.[4] G03G *15/09*
U.S. Cl. 430—35 12 Claims



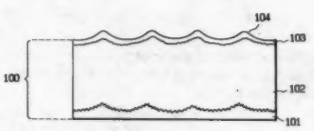
1. In a developing method wherein an image retainer, on which a latent electrostatic image is formed, and a developer feeding carrier of a composite developer, which comprises a toner and a carrier and contains a chargeable component, face each other across a gap formed between the surfaces thereof which is larger than the thickness of the layer of said developer, said latent electrostatic image being developed in this construction, the improvement which comprises an oscillating electric field formed in a development area wherein said gap is maintained, the oscillating waveform of said oscillating electric field being variable automatically based on the detection of a potential of the latent electrostatic image formed on said image retainer to provide a control of a density of the developed image.

4,797,336

LIGHT RECEIVING MEMBERS HAVING A-SI(GE,SN) PHOTOSENSITIVE LAYER AND MULTI-LAYERED SURFACE LAYER CONTAINING REFLECTION PREVENTIVE LAYER AND ABRASION RESISTANT LAYER ON A SUPPORT HAVING SPHERICAL DIMPLES WITH INSIDE FACES HAVING MINUTE IRREGULARITIES

Mitsuru Honda; Atsushi Koike, both of Chiba; Kyosuke Ogawa, Miye, and Keiichi Murai, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1986, Ser. No. 924,265
Claims priority, application Japan, Nov. 2, 1985, 60-246473
Int. Cl.[4] G03G *5/085*
U.S. Cl. 430—57 35 Claims



1. A light receiving member comprising a support and a light receiving layer comprising a photosensitive layer and a surface layer having a free surface; said support having a surface provided with irregularities composed of spherical dimples, each

of said dimples having an inside face provided with minute irregularities; said photosensitive layer being composed of amorphous material containing silicon atoms and at least one selected form the group consisting of germanium atoms and tin atoms; said surface layer being multi-layered and having at least a reflection preventinve layer in the inside and an abrasion-resistant layer at the outermost side; and said reflection prevention layer and said abrasin-resistant layer having different refractive indices.

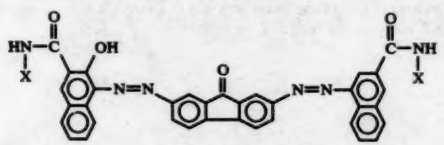
4,797,337

DISAZO PHOTOCONDUCTIVE IMAGING MEMBERS

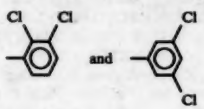
Kock-Yee Law, Fairport, and Ihor W. Tarnawskyj, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 27, 1987, Ser. No. 78,481
Int. Cl.[4] G03G 5/06
U.S. Cl. 430—58 42 Claims

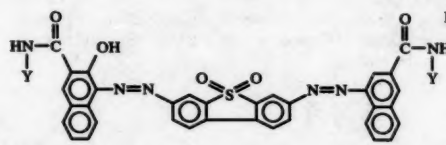
1. A photoconductive imaging member comprising a supporting substrate, a hole transport layer, and a photogenerating layer comprising disazo compounds selected from the group consisting of:



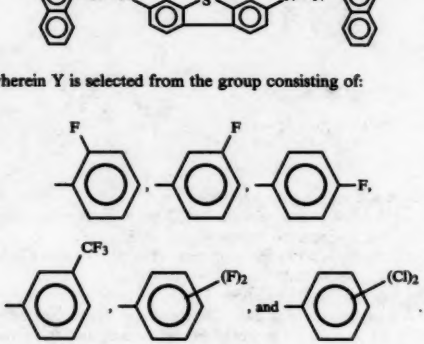
wherein X is selected from the group consisting of:



and



wherein Y is selected from the group consisting of:



4,797,338

PHOTOSENSITIVE MEMBER COMPRISING CHARGE GENERATING LAYER AND CHARGE TRANSPORTING LAYER

Syuji Iino, Hirakata; Hideo Hotomi, Suita; Noboru Saeki; Masanori Fujiwara, both of Osaka; Fumiko Uchino, Takatsuki, and Izumi Osawa, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1987, Ser. No. 95,930
Claims priority, application Japan, Sep. 16, 1986, 61-219005
Int. Cl.[4] G03G 5/10
U.S. Cl. 430—58 4 Claims

1. A photosensitive member comprising:
an electrically conductive substrate;
a vacuum evaporated layer formed from phthalocyanine compounds serving as a charge generating layer; and
a plasma polymerized layer serving as a charge transporting layer comprising amorphous carbon containing hydrogen.

4,797,339

TONER FOR DEVELOPING ELECTROSTATIC IMAGES

Masatoshi Maruyama; Yukinobu Hasegawa, and Toyokichi Tange, all of Hiratsuka, Japan, assignors to Nippon Carbide Koyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 924,738
Claims priority, application Japan, Nov. 5, 1985, 60-246322
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—109 19 Claims

1. A toner for developing an electrostatically charged image, comprising
(A) an inner layer comprising a resin ion complex comprising a resin particle-to-particle ionically crosslinked resin complex having a coloring agent and optionally a charge controlling agent and/or a magnetic material substantially dispersed therein, and
(B) an outer layer containing a flowability imparting agent.

4,797,340

DRY ELECTROPHOTOGRAPHIC TONER COMPRISING GRAFT COPOLYMER

Koichi Tanaka; Shigeo Aonuma; Yoshimi Amagai; Toshiaki Murofushi, and Takaaki Kimura, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 749,980, Jun. 28, 1985, abandoned.
This application Jul. 9, 1987, Ser. No. 71,520
Claims priority, application Japan, Jun. 29, 1984, 59-134773
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—109 19 Claims

1. A dry toner for use in electrostatic latent image development comprising a colorant in a resin binder, wherein said resin binder comprises a graft copolymer comprising
(a) a crystalline main chain-polymer portion of at least one selected from the group consisting of ethylene, propylene, and vinyl acetate,
(b) an unsaturated polyester main chain-polymer portion containing —COOH groups, and
(c) a vinyl side chain-polymer portion, wherein at least one of the —COOH groups in the unsaturated polyester main chain polymer is modified with a nitrogen-containing functional group selected from an amine, an ammonium salt, a betaine, a pyridinium salt, and an azine, wherein the index of modification of —COOH groups in the polyester portion, as represented by the expression

$$\frac{A.V._0 - A.V.}{A.V._0} \times 100$$

wherein $A.V._0$ is the acid value of the polyester main chain polymer prior to the modification, and A.V. is the acid value of the polyester main chain polymer after the modification, is at least 10.

4,797,341

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Kazuo Tsubuko, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1986, Ser. No. 903,810
Claims priority, application Japan, Sep. 10, 1985, 60-200749
Int. Cl.[4] G03G *13/10*
U.S. Cl. 430—114 5 Claims

1. A liquid developer for electrophotography comprising a coloring agent and toner particles dispersed in a highly insulating aliphatic hydrocarbon and/or halogenated hydrocarbon carrier liquid having a low dielectric constant, said toner particles having two particle size distributions of a mean small toner particle size in the range of 0.01 μm to 1 μm and a mean large toner particle size in the range of 2 μm to 30 μm, characterized in that said large toner particles in the range of 2 μm to 30 μm are prepared by using polytetrafluoroethylene as the main binder resin.

4,797,342

PROCESSES FOR THE PREPARATION OF LIQUID DEVELOPERS WITH LOW VAPOR PRESSURE COMPONENTS

Melvin D. Croucher, Oakville; Raymond W. Wong, Mississauga, and Stephan Drappel, Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1987, Ser. No. 124,230
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—137 19 Claims

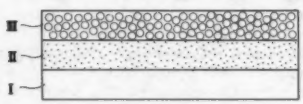
1. A process for the preparation of liquid developer compositions which comprises admixing molten resin components in a vehicle component possessing a vapor pressure of from about 0.01 to about 0.1 millimeter of mercury; thereafter adding thereto pigment particles; subsequently cooling and attriting the aforementioned resulting mixture thereby enabling entrapment of the vehicle in the developer composition; thereafter filtering and dispersing the resulting particles in a low viscosity oil; and adding to the formed composition a charge control director component.

4,797,343

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Taku Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1987, Ser. No. 43,129
Claims priority, application Japan, Apr. 25, 1986, 61-96340
Int. Cl.[4] G03C *5/54, 1/68, 1/06*
U.S. Cl. 430—138 11 Claims



1. A light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent and a polymerizabel compound containing carbon to carbon unsaturation and a layer containing a base or base precursor, both layers being provided on the same side of a support, wherein a barrier layer is provided between the light-sensitive layer and the layer containing a base or base precursor, said barrier layer keeping the base or base precursor from the light-sensitive layer and, when heated, allowing transmission of the base or base precursor therethrough.

8. The light-sensitive material as claimed in claim 1, wherein the polymerizable compound is contained in microcapsules which are dispersed in the light-sensitive layer.

4,797,344

ENCAPSULATED TONER HAVING SHELL WITH FIRST VINYL POLYMER WITH MN OF 2000-225000 AND SECOND VINYL POLYMER WITH MN OF 1000-15000

Toshiaki Nakahara, Tokyo; Ichiro Ohsaki, Kawasaki; Hisayuki Ushiyama, Hiratsuka; Masashi Kiuchi; Masuo Yamazaki, both of Kawasaki; Yasuhide Goseki, and Hisayuki Ochi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 911,099
Claims priority, application Japan, Sep. 30, 1985, 60-214988
Int. Cl.[4] G03G *9/16*
U.S. Cl. 430—138 20 Claims

1. An encapsulaed toner for developing electrostatic images, comprising microcapsules comprising:

a core particle and an outer shell coating the core particle;

the outer shell comprising a mixture having predominant components of a vinyl polymer A comprising a copolymer of a styrene monomer and a tertiary amino group-containing vinyl monomer having a number-average molecular weight of 2,000–225,000 and a vinyl polymer B comprising a copolymer of a styrene monomer and a tertiary amino group-containing vinyl monomer having a number-average molecular weight of 1,000–15,000 of different number-average molecular weights; the ratio of the number-average molecular weight of the vinyl polymer A (Mn_A) to that of the vinyl polymer B (Mn_B) being in the range of 2 to 15; the vinyl polymers A and B respectively having a ratio of weight-average molecular weight to number-average molecular weight of 5 or less and the weight ratio of the vinyl polymer A to the vinyl polymer B being in the range of 1:4 to 10:1.

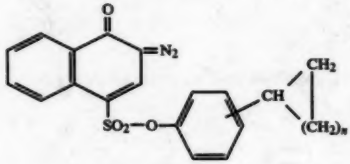
4,797,345

LIGHT-SENSITIVE 1,2-NAPHTHOQUINONE-2-DIAZIDE-4-SULFONIC ACID MONOESTERS OF CYCLOALKYL SUBSTITUTED PHENOL AND THEIR USE IN LIGHT-SENSITIVE MIXTURES

Alfred T. Jeffries, III, Providence, R.I., assignor to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Filed Jul. 1, 1987, Ser. No. 68,397
Int. Cl.[4] G03C *1/54, 1/76;* C07C *113/00*
U.S. Cl. 430—165 18 Claims

1. A light-sensitive 1,2-naphthoquinone-2-diazide-4-sulfonic acid monoester of a cycloalkyl-substituted phenol corresponding to the formula:

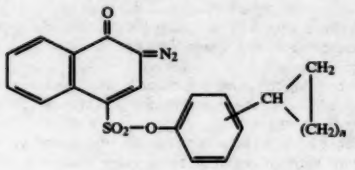


wherein n is from about 2 to about 10.

5. A light-sensitive mixture useful as a positive-working photoresist composition comprising in admixture:

(a) from about 50 to about 95 percent of at least one alkali-soluble resin; and

(b) from about 50 to about 5 percent of a light-sensitive 1,2-naphthoquinone-2-diazide-4-sulfonic acid monoester of a cycloalkyl-substituted phenol corresponding to the formula:

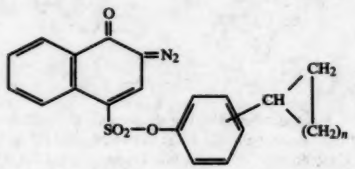


wherein n is from about 2 to about 10, said percentages of (a) and (b) are based on the non-volatile content of said mixture.

11. A coated substrate comprising a substrate material coated with a film of a light-sensitive mixture comprising in admixture:

(a) from about 50 to about 95 percent of at least one alkali-soluble resin; and

(b) from about 50 to 5 percent of a light-sensitive 1,2-naphthoquinone-2-diazide-4-sulfonic acid monoester of a cycloalkyl-substituted phenol corresponding to the formula:



wherein n is from about 2 to about 10, wherein said percentages of (a) and (b) are based on the non-volatile content of said mixture.

4,797,346

LIGHT-SENSITIVE COMPOSITION FOR POSITIVE-TYPE LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATES

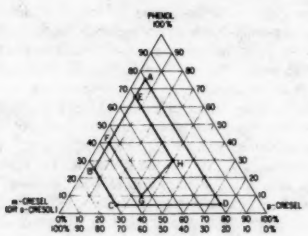
Takeshi Yamamoto, Mitaka; Nobumasa Sasa, Sayama, and Miegi Nakano, Chofu, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 884,206, Jul. 10, 1986, abandoned, which is a continuation of Ser. No. 743,775, Jun. 12, 1985, abandoned. This application May 13, 1987, Ser. No. 51,224

Claims priority, application Japan, Jun. 20, 1984, 59-127187

Int. Cl.[4] G03C *1/60*; G03F *7/08*

U.S. Cl. 430—192 **8 Claims**



1. A light-sensitive composition for positive-type light-sensitive lithographic printing plates comprising an admixture of a light-sensitive o-quinonediazide compound present in an amount of from 30 to 95% by weight of said light-sensitive composition and a novolak resin present in an amount of from 5 to 60% by weight of the total solid components of said light-sensitive composition, wherein

said novolak resin comprises at least two different novolak resins, said novolak resins each being a resin obtained by the polycondensation or co-polycondensation of an aldehyde with at least one compound selected from the group consisting of phenol, m-cresol, o-cresol and p-cresol, and the ratios in mole percentages of the respective sums of the quantities of said phenol, the quantities of one or both of said m-cresol and the quantities of said p-cresol, which are constituents for the polycondensation or co-polycondensation of each said novolak resin contained in said light-sensitive composition, to the total of the quantities of all said constituents are from 5 to 75 mole % for said phenol, from 20 to 70 mole % for one or both of said m-cresol and said o-cresol and from 5 to 75 mole % for said p-cresol.

4,797,347

PROCESS FOR PRODUCING ELECTRICALLY CONDUCTIVE COATING

Jürgen Finter, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 837,851, Mar. 6, 1986, Pat. No. 4,677,155, which is a continuation of Ser. No. 445,404, Nov. 30, 1982, abandoned. This application Apr. 6, 1987, Ser. No. 34,367

Claims priority, application Switzerland, Nov. 30, 1981, 7653/81

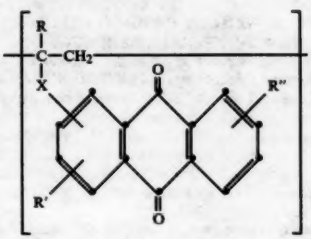
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] G03C *5/00*

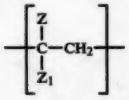
U.S. Cl. 430—311 **20 Claims**

1. A process for the production of electrically conductive coatings or patterns, which comprises

reducing the metal ions of an at least partly complexed polymer having an intrinsic viscosity of not less than 0.10 dl/g, measured at 25° C. in N,N-dimethylformamide, which consists of 1 to 40 mol % of recurring structural elements of the formula I

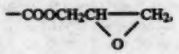

(I)

and 60 to 99 mol % of recurring structural elements of the formula II


(II)

in which R is hydrogen, methyl or ethyl, R′ and R″ independently of one another are hydrogen, C_1–C_4-alkyl, halogen, nitro or methoxy, X is —COO—, —CO—O—$(CH_2)_n$—, —CO—O—[$(CH_2)_n$—O]$_r$—CH_2—, —CO—O—[$(CH_2)_n$—O]$_r$—, —CO—O—[$CH_2CH(CH_3)O]_n$—, phenylene-CH_2—O—, —CO—O—[$(CH_2)_n$—O]$_r$—CO—, —CO—O—[$CH_2CH(CH_3)$ —O]$_n$CO—, —CO—NR—, phenylene-$CH_2O[(CH_2)_n$—O]$_r$—$(CH_2)_m$—, phenylene-

CH_2—O—$[(CH_2)_n$—O$]_r$—CO—, —$COOCH_2CH(OH)CH_2OCO$—, —$COOCH_2CH(OH)CH_2O$— or —CO—O—$[CH_2CH(CH_3)O]_rCH_2$—, m is zero or 1, n is an integer from 1 to 12, r is an integer from 1to 4, Z is hydrogen, chlorine or methyl, Z_1 is hydrogen, chlorine, methyl, —CN, —COOH, —$CONH_2$, phenyl, methylphenyl, methoxyphenyl chclohexenyl, imidazolyl, pyrrolidonyl, —COO—alkyl having 1–12 C atoms in the alkyl moiety, —COOphenyl,



—COO—alkylene-OH having 2–12 C atoms in the alkylene moiety, —$COO(CH_2CH_2O)_pH$ or —$COO[CH_2CH(CH_3)O]_pH$, where p is 2–4, —OCOalkyl having 1–4 C atoms in the alkyl moiety, —OCOphenyol, —COalkyl having 1–4 C atoms in the alkyl moiety, C_{1-12}-alkoxy, phenoxy, hydroxymethylphenyl, —CONH—C_{1-4}-alkylene—OH or —COO—C_{1-4}-alkylene—N(Q') (Q''), Q' is hydrogen or C_{1-5}alkyl and Q'' is C_{1-5}-alkyl, and in which, in not less than 20% of the structural elements of the formula II, Z_1 is —COO—C_{2-12}-alkylene-OH, —$COO(CH_2CH_2O)_pH$, —$COO[CH_2CH(CH_3)O]_pH$, hydroxymethylphenyl, —CONH—C_{1-4}-alkylene-OH or —COO—C_{1-4}-alkylene-N-(Q')(Q''), and the structural elements of the formula II are at least partly complexed with metal ions of a metal of group VIII or Ib of the periodic table, with the provison that, if X is —CO—O—CH_2—, Z_1 is —$COOCH_2CH_2OH$ in not more than 80% of the structural elements of formula II, to zero-valent, non-conductive metal nuclei by action of light, and

depositing metal thereon without a current.

4,797,348

METHOD OF FORMING A POSITIVE RESIST PATTERN IN PHOTORESIST OF O-NAPHTHOQUINONE DIAZIDE AND BISAZIDE WITH UV IMAGING EXPOSURE AND FAR UV OVERALL EXPOSURE

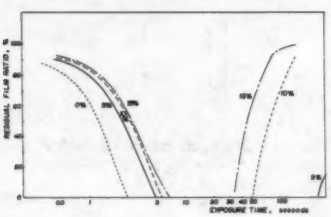
Yoichi Nakamura, Hiratsuka; Shirushi Yamamoto, Isehara; Takashi Komine, Yokohama; Akira Yokota, Yamato, and Hisashi Nakane, Kawasaki, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 935,592, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 690,584, Jan. 11, 1985, abandoned, which is a division of Ser. No. 541,570, Oct. 13, 1983, abandoned. This application Feb. 17, 1988, Ser. No. 161,213

Claims priority, application Japan, Oct. 13, 1982, 57-179325; Oct. 29, 1982, 57-190544; Oct. 29, 1982, 57-190545

Int. Cl.[4] G03F 7/26

U.S. Cl. 430—326 **4 Claims**



1. A method for forming a positive type resist pattern on a substrate by use of a dually photosensitive composition negatively photosensitive under a first condition of exposure to light and positively photosensitive under a second condition of exposure to light which comprises the steps of:

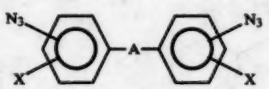
(a) forming a layer of the dually photosensitive composition in admixture with a novolac type phenolic resin on the substrate;

(b) subjecting the layer of the dually photosensitive composition to a pattern-wise exposure to light under the second condition of exposure;

(c) developing the layer of the dually photosensitive composition with an organic or inorganic alkaline solution to form a positive type resist pattern;

(d) subjecting the developed layer of the dually photosensitive composition to a whole-surface exposure to light under the first condition of exposure;

wherein the dually photosensitive composition comprises an admixture of an o-naphthoquinone diazide and novolac type phenolic resin based photoresist material of the positive type, and from 5 to 50 parts by weight per 100 parts by weight of the o-naphthoquinone diazide-based photoresist material on a solids basis, of a bis azide compound cross linkable by irradiation with far ultraviolet light in the wavelength region of 200 to 330nm represented by the general formula:



in which A is a divalent atom or group selected from the class consisting of an oxygen atom, a sulfur atom, a disulfide linkage S_2, a sulfone linkage SO_2 and a methylene group CH_2 and X is a hydrogen atom or a chlorine atom; and wherein the step (b) comprises subjecting layer of a dually photosensitive composition to pattern-wise exposure with ultraviolet light, and the step (d) comprises subjecting the layer of dually photosensitive composition to whole-surface exposure with far ultraviolet light, after developing, to produce a good heat and solvent resistant patterned resist.

4,797,349

METHOD FOR FORMING A COLOR IMAGE COMPRISING DEVELOPING A LIGHT SENSITIVE MATERIAL CONTAINING A SURFACTANT WITH A DEVELOPER NOT CONTAINING BENZYL ALCOHOL

Osamu Takahashi; Tadashi Ogawa; Minoru Sakai, and Masaharu Toriuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1987, Ser. No. 39,203

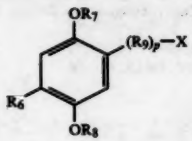
Claims priority, application Japan, Apr. 16, 1986, 61-85857

Int. Cl.[4] G03C 7/30

U.S. Cl. 430—372 **11 Claims**

1. A method for forming a color image which comprises imagewise exposing a color photographic material comprising a reflective support having thereon at least one photosensitive layer containing a color coupler capable of forming a dye image through its coupling reaction with an oxidation product of aromatic primary amine color developing agent and a silver halide emulsion and processing it with a color developing solution containing substantially no benzyl alcohol, wherein the color development is carried out under the condition that at least one substantially anionic surface active agent having an unsubstituted aliphatic group, a substituted aliphatic group excluding a fluorine-substituted aliphatic group, or an unsubstituted or substituted aromatic group as a hydrophobic group and —SO_3M, —SO_2M, —OSO_3M, or —OSO_2M, wherein M represents a hydrogen atom or a metallic atom or atomic group capable of being a cation, as a hydrophilic group in the molecule thereof is present in a total amount within a range of from 0.1 to 3 times the total weight of the color couplers applied in the photosensitive layer during the color development, and

wherein said anionic surface active agent comprises at least one compound represented by formula (IV)



(IV)

wherein R_6 represents a substituted or unsubstituted alkyl, alkoxy, aromatic or alkylthio group containing 6 or more carbon atoms; R_7 and R_8 each represents a hydrogen atom or an alkyl group containing from 1 to 18 carbon atoms; R_9 represents an alkylene group containing from 1 to 4 carbon atoms; p represents 0 or 1; and X represents $-SO_3M$, $-SO_2M$, $-O-SO_3M$, or $-OSO_2M$, wherein M represents a hydrogen atom or a metallic atom or atomic group capable of being a cation.

4,797,350

PROCESS FOR FORMING DYE-IMAGE USING A DEVELOPER COMPRISING AN IMAGE STABILIZER, A HYDROXYLAMINE AND NOT CONTAINING BENZYL ALCOHOL

Keiji Ohbayashi; Shigeo Chino; Mitsuhiro Okumura, all of Hino, and Kaoru Onodera, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 35,078

Claims priority, application Japan, Apr. 16, 1986, 61-87489

Int. Cl.[4] G03C 7/16, 7/40

U.S. Cl. 430—380 **17 Claims**

1. A process for forming a dye-image comprising the steps of:

imagewise exposing a silver halide photographic light-sensitive material which comprises a support, provided thereon, with at least one silver halide emulsion layer containing a hydrophobic dye-forming coupler and at least one compound selected from the group consisting of compounds having sterically hindbbKred phenol group and polyalkylpiperidine compounds, and

color developing said silver halide photographic light-sensitive material with a color developer comprising an aromatic primary amine and an N,N-dialkylhydroxylamine or the water soluble acid salt thereof and not containing benzyl alcohol.

4,797,351

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Masao Ishikawa; Shigeharu Koboshi; Kazuyoshi Miyaoka, and Satoru Kuse, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

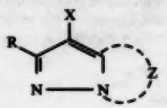
Filed Apr. 25, 1986, Ser. No. 856,779

Claims priority, application Japan, Apr. 30, 1985, 60-94760

Int. Cl.[4] G03C 7/30, 7/38

U.S. Cl. 430—387 **30 Claims**

1. A processing method of an image-wise exposed silver halide color photographic light-sensitive material comprising a replenishing process to replenish a color developer-replenisher to a color developer being used for said processing, wherein said silver halide color photographic material comprises at least one emulsion layer comprising a core-shell structural silver halide grain containing not less than 3 mol% of silver iodide and a magenta coupler represented by the following general formula [I], and said color developer replenisher contains 0 to 3.0×10^{-3} mol of bromide per liter and a replenishing volume of said color developer-replenisher to be replenished to said color developer is 0.5 to 9 ml per 100 cm^2 of said silver halide color photographic light-sensitive material:



[I]

wherein,

Z represents a group of non-metallic atoms necessary to form a nitrogen-containing heterocyclic ring;

X represents a hydrogen atom or a substituent which is, upon a reaction with an oxidation product of a color developing agent, capable of being released from the coupler residue;

and R represents a hydrogen atom, substituent.

4,797,352

METHOD OF PROCESSING A SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITJVE MATERIAL

Shigeharu Koboshi, and Masayuki Kurematsu, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 739,378, May 30, 1985, abandoned. This application Jun. 19, 1986, Ser. No. 878,390

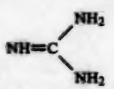
Claims priority, application Japan, Jun. 8, 1984, 59-116672

Int. Cl.[4] G03C 5/38, 7/42

U.S. Cl. 430—421 **7 Claims**

1. A method of processing an imagewise exposed silver halide photographic light-sensitive material characterized in that said material is developed and then processed with a first liquid capable of fixing and is, in succession, processed with a second liquid capable of stabilizing, without applying any intervening washing step, and containing at least one of the following compounds:

(A) a substituted or unsubstituted guanidine compound represented by

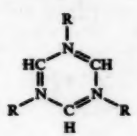


(B) a morpholine compound;

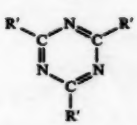
(C) a substituted or unsubstituted 2-carbonyl-amino-benzimidazole;

(D) A quaternary onium salt compound;

(E) a triazine compound represented by the following Formula (1) or (2)



(1)



(2)

wherein R is an alkyl group and R' is a halogen, amino group, alkyl group, or thioether group; or

(F) an oxazolone compound containing at least one each of N, O, and C═O in the five-membered ring thereof;

and wherein a ratio of a volume of said first liquid to a volume of said second liquid is not less than 1/2,000.

5. The method of processing an imagewise exposed silver

halide photographic light-sensitive material as claimed in claim 1 wherein a multistage stabilizing tank counter-flow system is used comprising a plurality of individual stabilizing tanks.

4,797,353

METHOD FOR DEVELOPMENT OF SILVER HALIDE PHOTOGRAPHIC MATERIALS UTILIZING REDUCED AMOUNTS OF ORGANIC SUBSTANCES

Sumito Yamada; Hiroshi Kawasaki, and Masaki Satake, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 10, 1987, Ser. No. 94,782
Claims priority, application Japan, Sep. 10, 1986, 61-213503; Dec. 15, 1986, 61-298405
Int. Cl.[4] G03C *1/02, 1/76, 1/495, 5/24*
U.S. Cl. 430—434 17 Claims

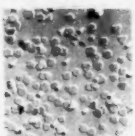
1. A method for processing a silver halide light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with an automatic developing machine which comprises developing an imagewise exposed silver halide light-sensitive material, wherein an amount of organic substances remaining in at least one of the emulsion layer or other hydrophilic colloid layers comprising a surface protective layer after said processing with said automatic developing machine, is not more than about 90 wt% of the weight of said organic substances prior to said processing, said organic substances being selected from the group consisting essentially of polyacrylamide, polyvinyl alcohol, polyvinyl pyrrolidone, Dextran and gelatin of the type which is free from cross-linking upon reaction with a hardener.

4,797,354

SILVER HALIDE EMULSIONS COMPRISING HEXAGONAL MONODISPERSE TABULAR SILVER HALIDE GRAINS

Mitsuo Saitou; Shigeharu Urabe, and Katsuhisa Ozeki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1987, Ser. No. 23,040
Claims priority, application Japan, Mar. 6, 1986, 61-48950; Dec. 16, 1986, 61-299155
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—567 8 Claims



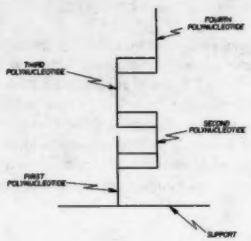
1. A silver halide emulsion comprising a dispersion medium and silver halide grains, wherein the projected area of hexagonal tabular silver halide grains having as the basal planes having an adjacent edge ratio of 2/1 to 1/1 accounts for from 70% to 100% of the projected area of the whole silver halide grains, and further said hexagonal tabular silver halide grains are monodisperse grains wherein the average aspect ratio of the hexagonal tabular silver halide grains is from 2.5/1 to 20/1.

4,797,355

METHODS FOR ATTACHING POLYNUCLEOTIDES TO SUPPORTS

Yitzhak Stabinsky, Boulder, Colo., assignor to Amgen Inc., Thousand Oaks, Calif.

Filed Jun. 13, 1985, Ser. No. 744,507
Int. Cl.[4] C12Q *1/68;* G01N *33/566*
U.S. Cl. 435—6 3 Claims



1. A method for a hybridization assay comprising the steps of:

attaching a first single-stranded polynucleotide to a support so that the first single-stranded polynucleotide has a first free end;

hybridizing a first portion of a second single-stranded polynucleotide with the first single-stranded polynucleotide so that the second single-stranded polynucleotide has a free single-stranded end;

connecting by hybridization a third single-stranded polynucleotide to a second portion of the second single-stranded polynucleotide, separate and distinct from the first portion of the second single-stranded polynucleotide, so that the third single-stranded polynucleotide has a first end adjacent the first end of the first single-stranded polynucleotide;

ligating the first end of the first single-stranded polynucleotide to the first end of the third single-stranded polynucleotide to form a probe polynucleotide bound to the support;

denaturing the second single-stranded polynucleotide from the probe polynucleotide; and

immobilizing a fourth polynucleotide constituting a target analyte by hybridization to the probe polynucleotide.

4,797,356

MONOCLONAL ANTIBODIES SPECIFIC TO GLACTOSYLTRANSFERASE ISOENZYME II AND THEIR USE IN CANCER IMMUNOASSAYS

Alan E. Brandt, Redwood City, and Morito Uemura, Menlo Park, both of Calif., assignors to Konishiroku Photo Industries, Co., Ltd, Japan

Filed Dec. 2, 1985, Ser. No. 803,818
Int. Cl.[4] G01N *33/53, 33/577;* G07K *15/14*
U.S. Cl. 435—7 11 Claims

1. A monoclonal antibody to galactosyltransferase II that has no measurable cross-reactivity with galactosyltransferase I.

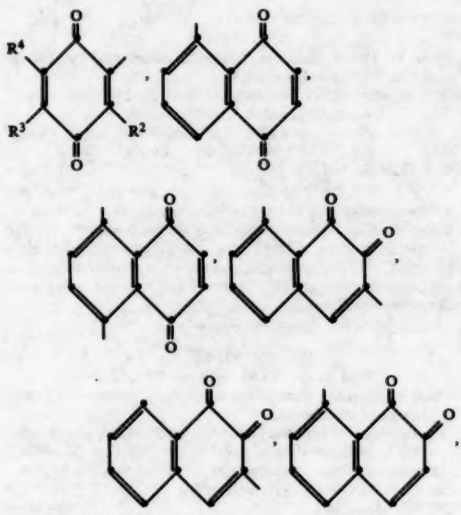
4,797,357

LIGHT-STABLE REDUCIBLE COMPOUNDS AND ANALYTICAL COMPOSITIONS, ELEMENTS AND METHODS UTILIZING SAME

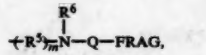
Albert J. Mura, and Paul B. Merkel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1986, Ser. No. 868,479
Int. Cl.[4] C12Q *1/04*; C07C *50/00*
U.S. Cl. 435—34 18 Claims

1. A reducible compound of the structure $CAR—R^1)_n$ wherein n is 1 or 2, CAR— is a substituted or unsubstituted aromatic or quinone nucleus selected from the group consisting of



and the nucleus of a 1,2-, 1,4- or 9,10-anthraquinone, 4,4'-diphenoquinone, azuloquinone, or 1,6-anulenoquinone wherein R^1 is attached to the nucleus adjacent to one of the oxo groups of the nucleus, and R^1 is



R^2 and R^4 are independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl or an electron withdrawing group,

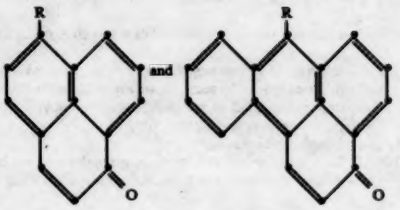
R^3 is the same as R^1, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl or an electron withdrawing group, provided that at least one of R^2, R^3 and R^4 is an electron withdrawing group, or R^3 and R^4, taken together, represent the atoms necessary to complete a substituted or unsubstituted strained fused carbocyclic ring,

R^5 is substituted or unsubstituted alkylene of 1 or 2 carbon atoms,

R^6 is a substituted or unsubstituted organic group having a molecular weight of at least 40, or together with R^5 forms a divalent substituted or unsubstituted heterocyclic group having at least 5 atoms in the ring,

Q is carbonyl or thiocarbonyl,

FRAG is a moiety derived from a phenalenone or benzphenalenone dye selected from the group consisting of



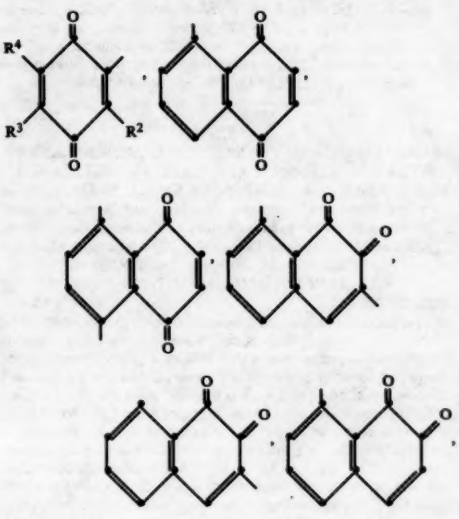
wherein R is hydroxy or mercapto, and

m is 0 or 1,

provided that when R^1 is replaced with H, CAR-H has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water using a normal hydrogen electrode as a standard.

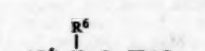
14. A method for the determination of an analyte comprising the steps of:

A. at a pH of 9 or less, contacting a sample of a liquid suspected of containing an analyte with a reducible compound of the structure $CAR—R^1)_n$ wherein n is 1 or 2, CAR— is a substituted or unsubstituted aromatic or quinone nucleus selected from the group consisting of



and the nucleus of a 1,2-, 1,4- or 9,10-anthraquinone, 4,4'-diphenoquinone, azuloquinone, or 1,6-anulenoquinone wherein R^1 is attached to the nucleus adjacent to one of the oxo groups of the nucleus, and

R^1 is



R^2 and R^4 are independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl or an electron withdrawing group,

R^3 is the same as R^1, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl or an electron withdrawing group, provided that at least one of R^2, R^3 and R^4 is an electron withdrawing group, or R^3 and R^4, taken together, represent the atoms necessary to complete

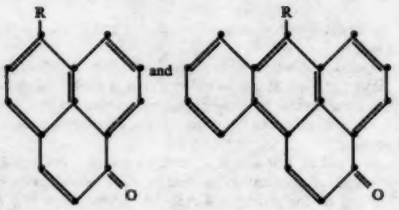
a substituted or unsubstituted strained fused carbocyclic ring,

R^5 is substituted or unsubstituted alkylene of 1 or 2 carbon atoms,

R^6 is a substituted or unsubstituted organic group having a molecular weight of at least 40, or together with R^5 forms a divalent substituted or unsubstituted heterocyclic group having at least 5 atoms in the ring,

Q is carbonyl or thiocarbonyl,

FRAG is a moiety derived from a phenalenone or benzphenalenone dye selected from the group consisting of



wherein R is hydroxy or mercapto, and

m is 0 or 1,

provided that when R^1 is replaced with H, CAR—H has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water using a normal hydrogen electrode as a standard, and

B. determining the phenalenone or benzphenalenone dye released as a result of the presence of said analyte.

4,797,358

MICROORGANISM OR ENZYME IMMOBILIZATION WITH A MIXTURE OF ALGINATE AND SILICA SOL

Hiroshi Motai; Yaichi Fukushima; Katsumichi Osaki, all of Noda; Katutoshi Okamura, Nagoya, and Kazutaka Imai, Owariasahi, all of Japan, assignors to Kikkoman Corporation, Noda and Fuji-Davison Chemical, Ltd., Aichi, both of, Japan

Filed May 28, 1985, Ser. No. 738,181

Int. Cl.[4] C12N *11/14, 11/02, 11/10, 11/04*

U.S. Cl. 435—176 **8 Claims**

1. A process for preparing an immobilized microorganism or enzyme which comprises mixing a starting microorganism or enzyme in the presence of water with an alginate selected from the group consisting of sodium alginate, potassium alginate and ammonium alignate and a silica sol, said silica sol havig a silica colloid particle diameter in the range of from 1 nm to 100 nm, a water solvent, and a pH in the range of 2 to 11, to obtain a liquid mixture having a pH of 3 to 10and containing an alginate concentration of 0.5 to 3.5% (w/v) and a silica concentration originating from the silica sol of 0.5 to 35% (w/v) selected from the group consisting of calcium chloride, aluminum chloride, calcium acetate and aluminum sulfate in the form of an aqueous solution to gel the mixture.

4,797,359

HEAT SHOCK REGULATED PRODUCTION OF SELECTED AND FUSED PROTEINS IN YEAST

David B. Finkelstein, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 10, 1983, Ser. No. 493,251

Int. Cl.[4] C12P *21/00, 21/02;* **C12N** *5/00;* **C07H** *15/12*

U.S. Cl. 435—68 **15 Claims**

1. A process for producing a transformed *S. cerevisiae* yeast microorganism capable of heat regulated synthesis of a selected unfused protein, which comprises:

(1) cleaving DNA having a heat shock inducible gene of a *S. cerevisiae* yeast microorganism to produce a promoter sequence of said heat shock inducible gene and excluding the structural gene sequence coding for the heat shock protein;

(2) preparing a recombinant transfer vector by combining a suitable transfer vector with said promoter sequence obtained in step (1) and a DNA fragment comprising a DNA sequence encoding for said selected heterologous protein, said transfer vector being capable of replication in a host yeast microorganism, said promoter sequence and said DNA fragment being capable of recombination;

(3) transforming said host yeast microroganism with said recombinant transfer vector;

(4) culturing said transformed host yeast microorganism; and

(5) selecting a transformed host microorganism capable of heat regulated synthesis of said selected unfused heterologous protein.

4,797,360

CONVERSION OF SUCROSE TO FRUCTOSE AND ETHANOL

Horst W. Doelle, Kenmore, Australia, assignor to The University of Queensland, Australia

Continuation of Ser. No. 594,580, Mar. 29, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 936,764

Claims priority, application Australia, Sep. 27, 1983, PG1587

Int. Cl.[4] C12P *19/02, 7/06, 7/14;* **C12N** *1/20*

U.S. Cl. 435—105 **17 Claims**

1. A method for the production of fructose and ethanol from sucrose, comprising the step of fermenting sucrose, using the microorganism *Zymomonas mobilis* in the presence of a fermentation medium wherein the concentration of sucrose is greater than 30% by weight, to produce a fermentation product consisting essentially of ethanol and fructose under semi-anaerobic conditions.

4,797,361

MICROORGANISM AND PROCESS

Bland S. Montenecourt, Bloomsbury, N.J., assignor to Lehigh University, Bethlehem, Pa.

Continuation of Ser. No. 868,168, May 22, 1986, abandoned, which is a continuation of Ser. No. 544,819, Oct. 24, 1983, abandoned. This application Sep. 11, 1987, Ser. No. 96,766

Int. Cl.[4] C12N *9/20, 9/22, 9/26, 9/30, 9/42, 9/58, 1/14, 1/22*

U.S. Cl. 435—198 **10 Claims**

3. A process utilizing *Trichoderma reesei* RL-P37 for the production of an extracellular glycoprotein enzyme, from the group consisting of cellulases, laminarinases, amylase, xylanases and pectinases, said process comprising culturing the microbial strain RL-P37 and permitting said cultured strain to secrete said enzyme.

4,797,362

ALKALINE PROTEASES AND MICROORGANISMS PRODUCING SAME

Keiji Takeuchi, Tokyo; Takashi Nishino; Motoyasu Odera, both of Odawara; Hisao Shimogaki, Minami-Ashigara, and Tahee Negi, Fujisawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 3, 1986, Ser. No. 870,018

Claims priority, application Japan, Jun. 6, 1985, 60-123021; Jun. 6, 1985, 60-123022; Dec. 20, 1985, 60-286944

Int. Cl.[4] C12N *9/54, 1/20, 9/50, 9/56, 9/52*

U.S. Cl. 435—221 **11 Claims**

1. Alkaline protease Ya having the following physicochemical properties:

a. activity: decomposes various proteins in highly alkaline conditions,

b. substrate specificity: remarkably specific to insoluble proteins, particularly to keratin,

c. optimal pH: pH 10.0 to 12.5 when reacted at 35° C. for 10 minutes on a casein substrate,

d. pH range for stability: pH 6.5 to 13.0 when incubated at 25° C. for 24 hours on a casein substrate,

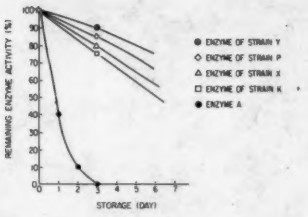
e. optimal temperature: 70° C. when reacted at pH 10.5 on a casein substrate,

f. thermal stability: at least 90% of the activity remains after incubation at pH 10.5 and 60° C. for 10 minutes,

g. absorption spectrum: maximum absorption at 276 nm in 50 mM Tris-HCl buffer of pH 8.0,

h. effect of metal ions: the activity is inhibited by Hg^{2+} ion and thermal stability of the enzyme is increased by Ca^{2+} ion when casein is used as a substrate,

i. effect of inhibitors: when casein used as a substrate, the activity is not inhibited by EDTA (ethylenediaminetetra-



acetate) and PCMB (p-chloromercury benzoate), but inhibited by DFP (diisopropylfluorophosphate) and PMSF (phenylmethylsulfonyl fluoride),

j. effect of surfactants: when stored in heavy duty liquid detergent at 40° C. for one month, the full activity remains at pH 9.0 and 50% of the activity at pH 10.5,

k. molecular weight: 21,000 (gel filtration method using Toyopearl HW-55), and

l. isoelectric point: 10.1 (isoelectric focusing electrophoresis method using Pharmalyte 3-10).

4,797,363

BACTERIOPHAGES AS RECOGNITION AND IDENTIFICATION AGENTS

Marius C. Teodorescu, Westchester, and Alexandre M. Gaspar, Chicago, both of Ill., assignors to Board of Trustees, University of Illinois, Urbana, Ill.

Continuation of Ser. No. 591,136, Mar. 19, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,328

Int. Cl.[4] C12N *7/00, 7/02, 13/00;* **C12Q** *1/70*

U.S. Cl. 435—235 **6 Claims**

1. A method for preparing a bacteriophage binding through a head segment to molecular or cellular materials, comprising the steps of:

(a) mixing the bacteriophage, having both head and tail segments, with bacteria;

(b) irrading the mixture with ultraviolet light to effect mutation of the bacteriophage;

(c) nultiplying the mutant bacteriophage in the presence of bacteria binding through a tail segment to molecular of cellular material;

(d) purifying the population of nutant bacteriophage;

(e) binding the pruified mutant bacteriophage to the cellular material or to the molecular material; and

(f) multiplying the bound mutant bacteriophage in bacteria.

4,797,364

PROCESS FOR PREPARING CONCENTRATED AMOUNTS OF LYOPHILIZED MICROORGANISMS

Jean Amen, Versailles, and Michel Caban, Coublevie Voiron, both of France, assignors to l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 663,986, Oct. 23, 1984, abandoned. This application May 5, 1987, Ser. No. 46,261

Claims priority, application France, Oct. 27, 1983, 83 17156

Int. Cl.[4] C12N *1/00, 1/02*

U.S. Cl. 435—243 **11 Claims**

1. In a process for preparing microorganisms, of the type comprising the steps of: supplying a culture medium, which was previously seeded and maintained at a temperature of between 25° C. and 45° C. with a nutritive substrate comprising lactose and yeast, a neutralizing agent selected to maintain the pH of the culture medium at a constant value between 5.5 and 7.5, the whole being diluted in water; adjusting the supplies of substrate and water relative to the neutralizing agent based on a determination of the concentration of inhibiting agent generated by the microorganisms, said inhibiting agent retarding the subsequent growth of microorganisms as a function of its concentration; and effecting an ultrafiltration operation for reducing the quantity of said inhibiting agent while maintaining a constant volume of the culture medium, the improvement comprising the steps of:

(a) ceasing the supply of nutritive substrate and water, while maintaining the pH at said constant value by supplying said neutralizing agent;

(b) continuing the ultrafiltration operation simultaneously with cooling at a temperature between 15° C. and 20° C. to obtain a primary concentration of microorganisms between 40 and 80 kg dry weight of microorganisms per cubic meter;

(c) washing said primary concentration with a washing solution comprising mineral salts and amino acids;

(d) ultrafiltering said washed primary concentration to a final concentration between 90 and 220 kg dry weight of microorganisms/cubic meter;

(e) cooling the said final concentration to a temperature of 5° C.; and

(f) lyophilizing said final concentration.

4,797,365

ACTIVE DRIED YEAST

Seymour Pomper, Stamford; Gary W. Cole, Ridgefield, both of Conn., and James R. Davis, Yorktown Heights, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jan. 22, 1985, Ser. No. 693,045

Int. Cl.[4] C12N *1/18*

U.S. Cl. 435—256 **10 Claims**

1. In a process for the preparation of active dried yeast comprising the steps of treating a yeast cream with an osmotically active salt solution, filtering to separate yeast from the yeast cream, washing the separated yeast with water, and drying the washed yeast, the improvement which comprises employing as said osmotically active salt solution an aqueous solution comprising calcium or magnesium chloride present in a concentration such that the amount of calcium or magnesium cation present is from about 0.1 percent to about 5 percent by weight based on the weight of yeast cream being treated.

6. A product produced according to the process of claim 1.

4,797,366

GAS TREATMENT AND RESIN REGENERATION PROCESS

Constant J. van Lookeren-Campagne, Woking, and Edward D. A. Obeng, Cobham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1987, Ser. No. 12,454

Claims priority, application United Kingdom, Feb. 17, 1986, 8603842

Int. Cl.[4] D06M *16/00;* **A61L** *9/01*

U.S. Cl. 435—264 **7 Claims**

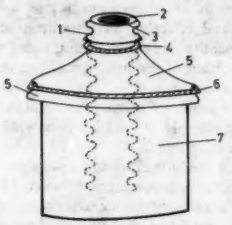
1. A process for the removal of hydrogen sulphide from contaminated gas which comprises treating the gas with a cation exchange resin doped with ions of a metal selected from magnesium, calcium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, cadmium and lead, and regenerating the resin by treatment thereof with an oxidising microorganism.

4,797,367

AEROBIC COMPOSTING APPARATUS

John A. Pinder, 3 Albacore Crescent, Scarborough, Ontario, Canada M1H 2L2

Filed Aug. 14, 1987, Ser. No. 84,814
Int. Cl.[4] C12M *1/04*; B01J *1/00*
U.S. Cl. 435—313 10 Claims



1. A composting apparatus comprising, in combination; (a) a compost containable container, and (b) a hollow tube-like structure with improvements in said hollow tube like structure including apertured corrugated side walls and including improved means enabling air admission while excluding wastes and pests from the hollow tube-like structure, said compost containable container having an access opening in an upper wall portion thereof providing access to the interior of the container, and the hollow tube-like structure being releasably installed in said access opening so as to be attachable to and detachable from the upper wall portion of the said container and on being attached to the said container substantially closing at least part of said access opening and said hollow tube-like structure including an air admitting portion, said portion having installed therein at least one member suitable for excluding flying insects and including, beyond that necessary to exclude flying insects larger than one tenth inch in their smallest dimension, means enabling the said member to resist displacement from the air admitting portion, said hollow tube-like structure being installed in the container, said air admitting portion being in communication with the atmosphere exteriorly of said hollow tube-like structure and exteriorly of said container and with the atmosphere interiorly of said hollow tube-like structure, and said hollow tube-like structure also including an air conveying portion, and whereupon the hollow tube-like structure being installed in the access opening of the container, that portion extending into the said container having apertured side walls permitting air in the interior of the hollow tube-like structure to be in communication with air exteriorly of the said hollow tube like structure.

4,797,368

ADENO-ASSOCIATED VIRUS AS EUKARYOTIC EXPRESSION VECTOR

Barrie J. Carter, Kensington, Md., and Jon D. Tratschin, Berne, Switzerland, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 15, 1985, Ser. No. 712,236
Int. Cl.[4] C12N *7/00, 15/00*; C12P *19/34, 21/00*
U.S. Cl. 435—320 4 Claims

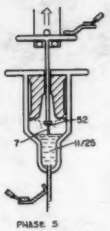
1. A vector comprising part of AAV DNA contained in a plasmid and capable of being packaged into AAV particles and functioning as a vector for stable maintenance or expression of a gene or a DNA sequence in eukaryotic cells when under control of an AAV transcription promotor.

4,797,369

METHOD AND APPARATUS FOR DETECTING A BLOOD CLOT

Michael Mintz, Edison, N.J., assignor to International Technidyne Corp., Edison, N.J.

Filed Apr. 5, 1985, Ser. No. 720,575
Int. Cl.[4] G01N *33/86*
U.S. Cl. 436—69 10 Claims



1. A method of detecting the formation of fibrin clots in whole blood or blood plasma comprising the steps of:

dispensing a sample of blood to be analyzed in a container,

moving a probe having a hydrophilic tip into said dispensed sample to cause a first part of said sample to adhere to said probe tip with a second part remaining in said container,

repeatedly moving said first part of said sample into said second part from a given fixed point at a given distance from said second part and out of said second part to repeatedly join and separate said first and second parts, a fluid bridge being formed between said parts by surface tension and during movement of said first part over a portion of said given distance away from said second part, said given distance being selected so that said fluid bridge collapses when said first part is separated from said second part by said given distance unless a fibrin clot is aligned and entrained within said bridge such that said clot connects said first part to said second part at said given distance,

applying an electrical potential between said parts when said first and second parts are separated at said given distance,

monitoring the electrical current between said first and second parts when said electrical potential is applied,

providing a signal when an electrical current is detected between said first and second parts indicative of the presence of an electrically conductive path between said first and second parts, said path comprising at least one fibrin clot simultaneously connected between both said first and second parts and entrained within said bridge when said first and second parts are separated at said given distance.

4,797,370

ANTIBODY PREPARATION WITH SPECIFICITY FOR 4-(2-AMINOETHYL) IMIDAZOYL GROUP MANUFACTURE AND USE OF THE ANTIBODY PREPARATION

Asta B. Berglund; Eva B. Akerblom, both of Upsala, and Anders J. Hedin, Täby, all of Sweden, assignors to Pharmacia AB, Upsala, Sweden

PCT No. PCT/SE86/00029, § 371 Date Sep. 24, 1986, § 102(e) Date Sep. 24, 1986, PCT Pub. No. WO86/04420, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 24, 1986, Ser. No. 914,825
Claims priority, application Sweden, Jan. 24, 1985, 8500340
Int. Cl.[4] G01N *33/531, 33/532, 33/543, 33/577*
U.S. Cl. 436—518 17 Claims

1. An anti-histamine antibody preparation in which a substantial part of the anitigen-binding entities that possess immunological affinity for histamine also possess immunological

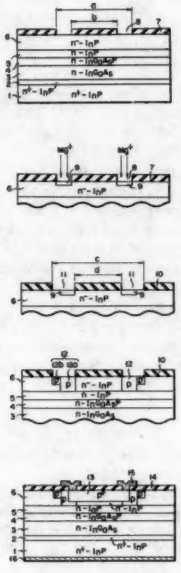
affinity for an aliphatically bound 4-(2-aminoethyl)imidazolyl group.

4,797,371

METHOD FOR FORMING AN IMPURITY REGION IN SEMICONDUCTOR DEVICES BY OUT-DIFFUSION

Fumihiko Kuroda, Kashiwa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1987, Ser. No. 131,732
Claims priority, application Japan, Feb. 26, 1987, 62-43567
Int. Cl.[4] H01L *21/383, 21/425*
U.S. Cl. 437—2 20 Claims



1. A method for forming an impurity region in a semiconductor device, in particular, a method including the following processes (a) through (c),

(a) a process that forms at least one second conductive type impurity doped region by means of doping second conductive type impurity selectively to a predetermined region of a first conductive type semiconductor layer constituting a semiconductor substrate;

(b) a process that forms on the surface of said semiconductor substrate a diffusion mask having a first opening for exposing at least one of said second conductive type impurity regions and having second opening for exposing a part at least one of said first conductive type semiconductor layer; and

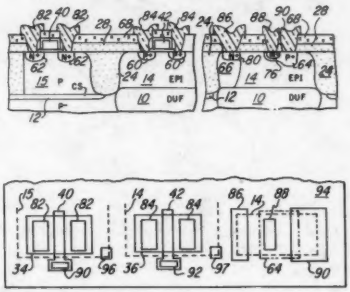
(c) a process that forms a low concentration second conductive type impurity region by out-diffusing through said first opening the second coductive type impurity in said second conductive type impurity region and doping the out-diffused impurity through said second opening to said first conductive type semiconductor layer, by means of heat treating.

4,797,372

METHOD OF MAKING A MERGE BIPOLAR AND COMPLEMENTARY METAL OXIDE SEMICONDUCTOR TRANSISTOR DEVICE

Douglas P. Verret, Sugarland, Tex.; Michael C. Smayling, Freising, Fed. Rep. of Germany; Abnash C. Sachdeva, Houston, and Stephen A. Keller, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 793,881, Nov. 1, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 922,961
Int. Cl.[4] H01L *21/22, 21/265*
U.S. Cl. 437—034 28 Claims



1. A method of making a merged bipolar and field effect transistor on a semiconductor substrate of a first conductivity type, comprising:

forming diffused buried DUF regions of a second conductivity type in said substrate;

growing an epitaxial layer of said second conductivity type over said substrate;

forming FET and bipolar dielectrically isolated isolation regions in said epitaxial layer; at least one FET isolation region being formed over one of said DUF regions;

forming a gate within said FET isolation region;

implanting a source and drain within said FET isolation region;

implanting a base in said bipolar isolation region substantially concurrently with the implanting of said source and drain in said FET isolation region;

protecting said gate from being implanted during said source, drain and base implants;

implanting a collector in said bipolar isolation region;

passivating the surface of the structure formed from the foregoing method steps, with a surface gettering material;

heating said structure so as to cause said collector implant to merge with the surface of said epitaxial layer and with said DUF region, said heating also causing activation of said source, drain, and base implants;

selectively etching away said gettering material; and

implanting an emitter in said bipolar isolation region.

4,797,373

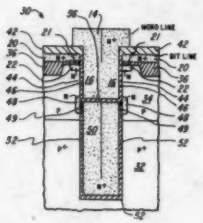
METHOD OF MAKING DRAM CELL WITH TRENCH CAPACITOR

Satwinder S. Malhi, Garland, and Gordon P. Pollack, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 873,466, Jun. 6, 1986, abandoned, which is a division of Ser. No. 666,715, Oct. 31, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 122,560
Int. Cl.[4] H01L *27/10, 21/302*
U.S. Cl. 437—60 5 Claims

1. A method for forming a coupled capacitor and transistor comprising the steps of;

forming a trench in the surface of a substrate;
coating the surfaces of said trench with a first insulating layer;
forming a first conductive region by filling the lower portion of said trench with a conductive material;
removing the exposed portion of said insulating layer plus an additional portion of said insulating layer between said conductive material and said substrate;
filling the crevice formed by said additional portion removal with a conductive material;



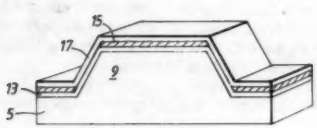
diffusing dopant atoms from said first conductive region, through said filled crevice, into said substrate to form a source region;
forming a drain region in said substrate adjacent the upper portion of said trench, separated from said source region by a channel region;
forming a gate insulating layer in the upper portion of said trench; and
filling the remainder of said trench with a conductive material which serves as a gate.

4,797,374

METHOD FOR SELECTIVE HETEROEPITAXIAL III-V COMPOUND GROWTH

Michael D. Scott, Northampton, Great Britain, and Alan H. Moore, Quebec, Canada, assignors to Plessey Overseas Limited, Ilford, England

PCT No. PCT/GB86/00423, § 371 Date May 20, 1987, § 102(e) Date May 20, 1987, PCT Pub. No. WO87/00694, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 18, 1986, Ser. No. 34,178
Claims priority, application United Kingdom, Jul. 20, 1985, 8518353
Int. Cl.[4] H01L *21/20, 21/76*
U.S. Cl. 437—129 **13 Claims**



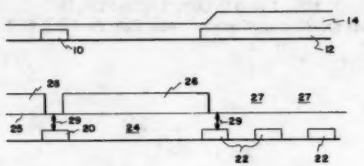
1. A method for producing a heterostructure semiconductor device, the method comprising defining a structure in a semiconductor substrate comprising Indium Phosphide, the structure comprising one or more first faces orientated parallel or near parallel to a first crystallographic plane andd one or more second faces parallel or near parallel to a second crystallographic plane, and exposing the structure to a group III vapour phase chemical reagent and a group V chemical reagent, thereby to deposit a first group III–V material on said first or said second faces using one group V constituent without the use of a mask and deposit a second group III–V material on both said first and said second faces using another group V constituent.

4,797,375

FABRICATION OF METAL INTERCONNECT FOR SEMICONDUCTOR DEVICE

David J. Brownell, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 658,104, Oct. 5, 1984, abandoned. This application Apr. 9, 1987, Ser. No. 36,185
Int. Cl.[4] H01L *21/441, 21/443*
U.S. Cl. 437—187 **13 Claims**



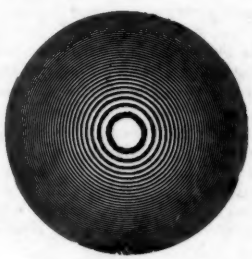
1. A method of forming a substantially planar insulating layer over metal features on a semiconductor device, wherein said semiconductor device has an upper surface which is substantially planar, comprising the steps of:
forming a plurality of said metal features directly on said upper surface, said metal features all being of substantially the same thickness, wherein at every point on each of said metal features, said metal feature is not substantially larger than a predetermined feature size in at least one direction parallel to said upper surface and wherein at least two of said metal features will operate together to perform the same function on said device; and
bias sputtering an insulating layer over said metal features, wherein said predetermined feature size is such that the surface of said insulating layer opposite said upper surface will be substantially planar.

4,797,376

SOL-GEL METHOD FOR MAKING GRADIENT-INDEX GLASS

J. Brian Caldwell, and Duncan T. Moore, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Jun. 9, 1987, Ser. No. 59,906
Int. Cl.[4] C03C *3/00, 3/06, 3/089, 3/093*
U.S. Cl. 501—12 **7 Claims**



1. A method for making a gradient-index glass comprising the steps of (1) forming a mixture between a silicon alkoxide and an alcohol in a slightly acidic water solution sufficient to partially hydrolyze the alkoxide, (2) adding to said mixture an index modifying metal alkoxide selected from the group con-

sisting of alkoxides of titanium and zirconium, (3) adding to said mixture at least one additional metal alkoxide element for providing an index modifying oxide wherein said metal alkoxide element is selected from the group consisting of alkoxides of aluminum, boron and germanium, (4) stirring the resulting solution with additional water sufficient to cause gelation by conversion of the metal alkoxides in solution to an interconnected network of the corresponding metal oxides, (5) pouring said solution into a mold, (6) allowing sufficient time for said solution to form a gel, (7) placing said gel into an acidic leaching bath for a time sufficient to leach out some of the index modifying metal oxide, (8) fixing said gel in an alcoholic bath, (9) drying said gel for a time sufficient to remove liquid within the gel, and (10) sintering said dried gel into transparent gradient index glass.

4,797,377

MASSIVE CRYSTALLINE ALUMINOSILICATE WITH EXPANDED STRUCTURE AND PROCESS FOR ITS MANUFACTURE

Yves Laurent, Cesson Sevigne; Patrick Verdier, and Jean Guyader, both of Acigne, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation of Ser. No. 838,914, Mar. 12, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 144,593

Claims priority, application France, Mar. 13, 1985, 85 03694

Int. Cl.[4] C03C *11/00*

U.S. Cl. 501—39 **6 Claims**

1. A massive partially crystalline aluminosilicate material comprising a plurality of expanded closed cell structures containing nitrogen gas.

4,797,378

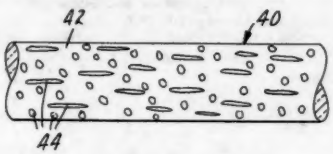
INTERNALLY MODIFIED CERAMIC FIBER

Harold G. Sowman, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1986, Ser. No. 830,651

Int. Cl.[4] C04B *35/00*

U.S. Cl. 501—95 **14 Claims**



1. A fiber comprising a continuous ceramic first phase and at least one in-situ-generated discontinuous metal or ceramic second phase.

4,797,379

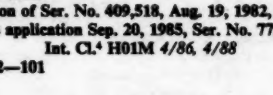
ELECTRODE STRUCTURE AND METHOD OF MAKING SAME

Pinakin S. Patel, Danbury, and Lawrence M. Paetsch, Sherman, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Continuation of Ser. No. 409,518, Aug. 19, 1982, abandoned. This application Sep. 20, 1985, Ser. No. 779,294

Int. Cl.[4] H01M *4/86, 4/88*

U.S. Cl. 502—101 **10 Claims**



1. A method of fabricating a molten carbonate fuel cell electrode from an electrode structure having pores, the method comprising:

preselecting an amount of carbonate constituent for said electrode;

selecting a stabilizing constituent for said electrode;

incorporating a ceramic oxide into said pores of said electrode structure;

incorporating an alkaline hydroxide in solution form into said pores of said electrode structure at about room temperature, said step of incorporating said alkaline hydroxide constituent including selecting the amount of alkaline hydroxide to be sufficient to enable said alkaline hydroxide and said ceramic oxide in the pores of said electrode structure to be converted to said preselected amount of carbonate constituent and said stabilizing constituent upon subjecting said electrode structure to carbon dioxide;

and subsequent to said incorporation steps, subjecting the electrode structure carrying said alkaline hydroxide and said ceramic oxide in the pores of the electrode structure to carbon dioxide to convert the alkaline hydroxide and said ceramic oxide to said preselected amount of carbonate constituent and said stabilizing constituent.

4,797,380

METHOD FOR PRODUCING HIGHLY DISPERSED CATALYST

Satoshi Motoo, and Masahiro Watanabe, both of Kofu, Japan, assignors to Satoshi Motoo; Masahiro Watanabe and Tanaka Kikinzoku Kogyo K.K., all of, Japan

Filed Mar. 5, 1987, Ser. No. 22,073

Claims priority, application Japan, Mar. 6, 1986, 61-49480; Mar. 6, 1986, 61-49481

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **5 Claims**

1. A method for producing a highly dispersed catalyst, comprising:

mixing a cross linking agent with a polymer having a reactive functional group in its molecular chain in a solvent in order to cross-link the polymer with the cross linking agent;

apply the mixture of cross-linked polymer and solvent to a carrier;

drying the carrier in order to remove the solvent therefrom, to form a polymer film of the polymer over the surface of the carrier;

impregnating the polymer film with a metallic complex compound solution in order in connect the complex compound to the reactive functional group of the polymer;

reducing the metallic complex compound connected to the polymer to the corresponding catalyst metal in a reducing atmosphere; and then heating the carrier in order to remove the polymer film by decomposition.

4,797,381

PREPARATION OF ABRASION RESISTANT ALUMINA-SUPPORTED VANADIUM-ANTIMONY OXIDIC CATALYSTS

Joseph P. Bartek, Highland Heights, and Andrew T. Guttmann, Maple Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 30, 1987, Ser. No. 79,551

Int. Cl.[4] B01J *23/18, 23/22, 23/30, 27/198*

U.S. Cl. 502—202 **7 Claims**

1. A method of making an active and abrasion resistant catalyst composition comprising at least 5 weight percent alumina support and at most 95 percent of a complex oxide composition having the empirical formula:

$$VSb_mA_eH_fC_cO_x$$

where

A is one or more of W, Sn, Mo, B, P and Ge;

H is one or more of Cu, Ag, Nb, Ta, Ti, Fe, Co, Ni, Cr, Pb, Mn Zn, Se, Te, Ga, In and As;

C is one or more of an alkali metal, alkaline earth metal, and rare earths; and

where m is from 0.01 and up to 20; a is 0–10; b is 0–20; c is 0–20; the ratio (a+b+c):(1+m) is 0.01–6; wherein x is determined by the oxidation state of the other elements, which method comprises mixing a hydrosol or gel of boehmite with a slurry or solution containing the other batch materials containing the elements of said formula, and thereafter drying and calcining the resultant solid.

4,797,382

HYDROGENATION CATALYST AND PROCESS FOR PREPARING THE CATALYST

Waldo De Thomas, Parsippany, and Paul D. Taylor, West Milford, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Nov. 27, 1987, Ser. No. 126,065
Int. Cl.[4] B01J *23/58, 23/64, 23/72*
U.S. Cl. 502—245 7 Claims

1. A hydrogenation catalyst consisting essentially of:

(a) between about 8 and about 40 wt. % of metallic copper;

(b) between about 0.05 and about 5 wt. % of palladium or a mixture of palladium with another metal having an atomic weight greater than 100 and selected from Groups VIIB and VIII of the Periodic Table; and

(c) between about 1.5 and about 10 wt. % of an alkali metal or alkaline earth metal supported on a magnesium silicate support in an amount of between about 45% and about 97% of the total composition.

4,797,383

CATALYST

Susan A. Topham, Stockton-on-Tees, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 563,546, Dec. 21, 1983, abandoned, which is a continuation of Ser. No. 352,059, Feb. 24, 1982, abandoned. This application Apr. 9, 1985, Ser. No. 721,137
Claims priority, application United Kingdom, Mar. 18, 1981, 8108409
Int. Cl.[4] B01J *23/74*
U.S. Cl. 502—338 4 Claims

1. A method of making a hydrogenation catalyst bed of particles having a size within a desired range within the range 1–20 mm comprising the steps of:

(a) melting a composition comprising iron oxide to the extent of a least 60% w/w calculated as Fe_2 '04' on its constituents not volatile at 900° C.;

(b) casting the melt on a surface to a depth within the desired size range and controlling the rate of cooling of the composition so that, on solidifying, the formed layer shrinks and separates from said surface;

(c) subdividing the resultant solid by light crushing effecting fracture through faces formed by solidification thereby producing particles over 50% w/w of which have two opposed faces formed by solidification, one of these faces is formed by solidification in contact with said surface, with the faces other than said two opposed faces formed by fracture;

(d) selecting from said particles, particles of the desired size range;

(e) without any further comminution or agglomeration of the selected particles, charging them to a hydrogenation reactor to form a bed of particles therein, and

(f) reducing the iron oxide of said selected particles to catalytically active metallic iron before or after step (e); said casting and solidification step (b) being effected to form channels in at least one of the solidification surfaces.

4,797,384

HEAT-SENSITIVE RECORDING SHEET

Akira Igarashi; Akihiro Shimomura, and Shinichiro Serizawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1988, Ser. No. 150,274
Claims priority, application Japan, Jan. 29, 1987, 62-18950
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 8 Claims

1. A heat-sensitive recording sheet comprising a paper support, on one side of which a heat-sensitive color forming layer is provided, and on the other side of which an antistatic layer is provided, wherein said antistatic layer contains: (a) at least one polymer of homopolymers and copolymers of vinyl compounds having a sulfonic acid group, having a weight-average molecular weight of at least 5,000; and (b) at least one surfactant selected from sulfosuccinates, alkylbenzenesulfonic acid salts and naphthalenesulfonic acid salts.

4,797,385

HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1987, Ser. No. 7,206
Claims priority, application Japan, Jan. 24, 1986, 61-13397
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—207 10 Claims

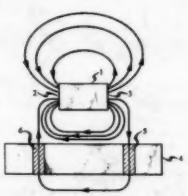
1. A heat-sensitive recording material comprising a support having provided thereon a heat-sensitive recording layer containing a colorless electron-donating dye precursor and an electron-accepting compound as main components, with said heat-sensitive recording layer containing granules of starch or a starch derivative, which have a volume average granule diameter of from 10 μm to 30 μm, in a proportion of from 0.2 wt % to 5 wt % based on the total weight of solids therein.

4,797,386

SUPERCONDUCTOR-MAGNET INDUCED SEPARATION

Ernst M. Gyorgy, Madison; Frances Hellman, Berkeley Heights, and David W. Johnson, Jr., Pluckemin, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Labs, Murray Hill, N.J.

Filed Apr. 22, 1987, Ser. No. 41,278
Int. Cl.[4] H01F *7/22*
U.S. Cl. 505—1 13 Claims



1. Apparatus comprising separated elements, separation of which is induced by force comprising magnetic-superconducting repulsion, in which, in the operating state one such element is superconducting and a second such element is magnetized, characterized in that the said superconducting element consists essentially of a Type II superconductor, and the properties and relative position of the elements are such that, in operation, the lower field value H_{c1} of the superconducting element is exceeded by a field produced by the magnetized element so as to result in magnetic field penetration within the superconducting element within at least one region which is at least partially surrounded by superconducting regions which are not field-

penetrated, whereby lateral stabilization of the said relative position is at least in part due to the fact that lateral shift requires field penetration in the direction of shift.

4,797,387

CERTAIN PHARMACEUTICALLY USEFUL UREAS

Francis D. King, Harlow, England, assignor to Beecham Group, p.l.c., Middlesex, England

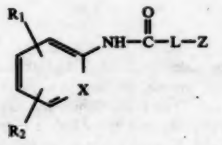
Filed Jan. 14, 1987, Ser. No. 3,222

Claims priority, application United Kingdom, Jan. 16, 1986, 8600978; Oct. 31, 1986, 8626042

Int. Cl.[4] A61K *31/46*; C07D *451/04*

U.S. Cl. 514—212 12 Claims

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



(I)

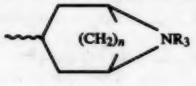
wherein

L is NH;

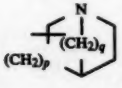
X is $N^+—O^-$, COR_5 wherein R_5 is hydrogen, C_{1-6} alkyl, C_{3-7} alkenyl-methyl, phenyl or phenyl C_{1-4} alkyl in which either phenyl moiety may be substituted by one or two C_{1-6} alkyl, C_{1-6} alkoxy or halo, or C—R_6 wherein R_6 is CO_2R_7 wherein R_7 is hydrogen or C_{1-6} alkyl, $CONR_8R_9$ or $SO_2NR_8R_9$ wherein R_8 and R_9 are independently hydrogen or C_{1-6} alkyl or together are C_{4-6} polymethylene, or R_6 is NO_2, $(CH_2)_mOR_{10}$ wherein m is 1 or 2 and R_{10} is C_{1-6} alkyl or $S(O)_nR_{11}$ wherein n is 0, 1 or 2 and R_{11} is C_{1-6} alkyl;

R_1 and R_2 are independently selected from hydrogen, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-7} acyl, C_{1-7} acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6} alkylsulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphinyl, carboxy, C_{1-6} alkoxycarbonyl, hydroxy, nitro or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C_{1-4} alkylamino optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl or phenyl C_{1-4} alkyl groups or optionally N-disubstituted by C_{4-5} polymethylene; and

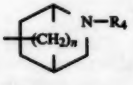
Z is a group of formula (a), (b) or (c)



(a)



(b)



(c)

wherein n is 2 or 3; p is 1 or 2; q is 1 to 3; r is 1 to 3; and R_3 or R_4 is C_{1-7} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl or C_{2-7} alkenyl-C_{1-4} alkyl.

4,797,388

PHARMACEUTICAL COMPOSITIONS WITH GALACTITOL AS CARRIER

Daniel L. Francis, Ravenna, Ohio, assignor to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 612,626, May 21, 1984, Pat. No. 4,659,699, which is a continuation-in-part of Ser. No. 524,899, Aug. 22, 1983, abandoned. This application Jun. 26, 1986, Ser. No. 879,143

Int. Cl.[4] A61K *31/66*, *31/70*, *47/00*

U.S. Cl. 514—23 16 Claims

1. A hydrated lyophilizate composition, having enhanced chemical and physical stability and uniform appearance and consistency, comprising about 20 parts by weight of cyclophosphamide, taken as the anhydride, about 5 to 21 parts by weight of galactitol, and about 1.4 to 3 parts by weight of water.

4,797,389

SUBSTANCE HAVING AN ANTI-INFECTIVE ACTIVITY

Rintaro Nakaya; Noboru Okamura, both of Tokyo; Takuji Kawashima, Kawasaki; Minoru Saito, Komae; Nabuya Yanai, Nakano; Tomohiro Tolda, Hachioji, and Hajime Yokota, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,771

Claims priority, application Japan, May 9, 1985, 60-96725

Int. Cl.[4] A61K *31/715*

U.S. Cl. 514—54 12 Claims

1. A substance having an anti-infective activity comprising a polysaccharide separated from the cell wall of bacteria belonging to genus Bifidobacterium, wherein the substance has the following physical and chemical properties:

(a) molecular weight; 15,000 to 200,000 daltons as determined by gel filtration;

(b) constituent saccharides; mainly composed of glucose and galactose at the molar ratio of 1:about 2.8; and

(c) elementary analysis; 44.6% of carbon, 6.2% of hydrogen and 0.2% or less of nitrogen.

4,797,390

INOSITOL TRIPHOSPHATE PHARMACEUTICAL COMPOSITIONS

Matti Siren, Via Poporino 9, CH-6926 Montagnola/Lugano, Switzerland

Continuation-in-part of Ser. No. 788,801, Oct. 18, 1985, Pat. No. 4,735,936. This application Feb. 17, 1987, Ser. No. 15,679

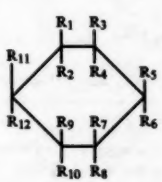
Claims priority, application Sweden, Oct. 23, 1984, 8405295

The portion of the term of this patent subsequent to Apr. 5, 1988, has been disclaimed.

Int. Cl.[4] A61K *31/66*; C12P *7/02*

U.S. Cl. 514—103 21 Claims

1. A pharmaceutical composition comprising as a pharmaceutically active ingredient an isomer of inositol triphosphate, a salt thereof or an acid thereof and a pharmaceutically acceptable carrier, excipient or additive thereof, said isomer having the structural formula



where

(a) three of R_1, R_3, R_5, R_7, R_{10} and R_{11} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_6, R_8, R_9 and R_{12} are hydrogen;

(b) three of R_1, R_3, R_6, R_7, R_9 and R_{12} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_5, R_8, R_{10} and R_{11} are hydrogen;
(c) three of R_1, R_3, R_5, R_8, R_{10} and R_{12} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_6, R_7, R_9 and R_{11} are hydrogen;
(d) three of R_1, R_4, R_5, R_8, R_9 and R_{12} are hydroxyl and the remaining three are phosphate and R_2, R_3, R_6, R_7, R_{10} and R_{11} are hydrogen;
(e) three of R_1, R_3, R_6, R_8, R_9 and R_{12} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_5, R_7, R_{10} and R_{11} are hydrogen;
(f) three of R_1, R_3, R_6, R_7, R_{10} and R_{12} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_5, R_8, R_9 and R_{11} are hydrogen;
(g) three of R_1, R_3, R_5, R_8, R_{10} and R_{11} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_6, R_7, R_9 and R_{12} are hydrogen;
(h) three of R_1, R_3, R_5, R_7, R_9 and R_{11} are hydroxyl and the remaining three are phosphate and R_2, R_4, R_6, R_8, R_{10} and R_{12} are hydrogen.

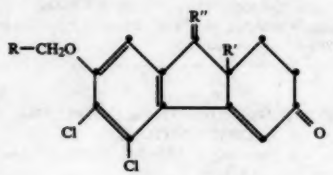
4,797,391

((5,6-DICHLORO-3-OXO-9,9A-DISUBSTITUTED-2,3,9,9A-TETRAHYDROFLUOREN-7-YL)OXY)ALKANOIC ACIDS AND ALKANIMIDAMIDES

Otto W. Woltersdorf, Jr., Chalfont; Edward J. Cragoe, Jr., Lansdale, and Adolph M. Pietruszkiewicz, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

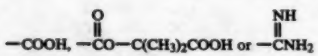
Continuation of Ser. No. 910,924, Sep. 24, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 150,462
Int. Cl.[4] A61K *31/645;* **C07C** *129/12*
U.S. Cl. 514—120 **16 Claims**

1. A compound of the formula:



(II)

wherein:
R is



R′ is lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms; and
R″ is =O, H plus

and the pharmaceutically acceptable salts thereof.

4,797,392

USE OF ANORECTAL COMPOSITIONS

Simon A. Chernomorsky, P.O. Box 2882, Elizabeth, N.J. 07207

Filed Jan. 27, 1987, Ser. No. 6,780
Int. Cl.[4] A61K *31/555, 31/40*
U.S. Cl. 514—185 **3 Claims**

1. A method of treating hemorrhoids and anorectal fissures, cracks, fistulas and abcesses, which comprises topically applying an anti-anorectal disease effective amount of a chlorophyll derivative to a host in need thereof.

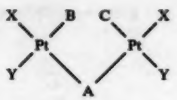
4,797,393

BIS-PLATINUM COMPLEXES AS CHEMOTHERAPEUTIC AGENTS

Nicholas Farrell, Winooski; Miles P. Hacker, Williston; John J. McCormack, Burlington, and Sergio G. DeAlmeida, Winooski, all of Vt., assignors to University of Vermont and State Agricultural College, Burlington, Vt.

Filed Jul. 25, 1986, Ser. No. 889,397
Int. Cl.[4] C07F *15/00*
U.S. Cl. 514—188 **22 Claims**

1. A bis-platinum complex having the structure:



in which X and Y are the same or different ligands and are halide, sulphate, phosphate, nitrate, carboxylate, substituted carboxylate, or dicarboxylate; B and C are the same or different groups selected from primary and secondary amines and pyridine type nitrogens; and A is a diamine or polyamine wherein the primary amine N atoms are coordinated to the Pt atom such that platinum is present as Pt^{2+}.

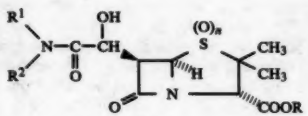
4,797,394

6-(1-CARBAMOYL-1-HYDROXYMETHYL)PENICILLANIC ACID DERIVATIVES

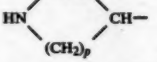
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US85/02134, § 371 Date Jun. 5, 1987, § 102(e) Date Jun. 5, 1987
PCT Filed Oct. 29, 1985, Ser. No. 85,675
Int. Cl.[4] C07D *499/00;* **A61K** *31/425*
U.S. Cl. 514—192 **86 Claims**

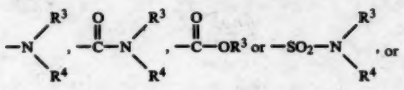
1. A compound having the formula



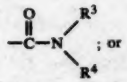
wherein
n is 0, 1 or 2;
R is hydrogen, a radical group forming an ester hydrolyzable under physiological conditions, or an acyloxymethyl or 1-(acyloxy)ethyl radical derived from a conventional beta-lactam antibiotic; and
R^1 and R^2 are taken separately and are each independently hydrogen, (C_1–C_7)alkyl, phenyl, (C_7–C_{12})phenylalkyl, (C_3–C_7)cycloalkyl, naphthyl, or



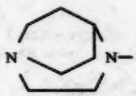
where m is 1 or 2 and p is 1, 2 or 3; or one of said groups substituted on aliphatic, aromatic or heterocyclic carbon with (C_1–C_4)alkyl, phenyl, hydroxy, hydroxymethyl, 2-hydroxyethyl, (C_1–C_4)alkoxy, (C_2–C_5)alkanoyloxy, carbamoyloxy, formamido, (C_2–C_5)alkanecarboxamido, (C_1–C_4)alkanesulfonamido,



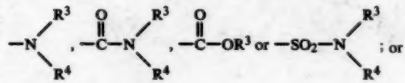
on heterocyclic nitrogen with (C_1–C_4)alkyl, phenyl, (C_7–C_9)phenylalkyl, pyridyl, 2-hydroxyethyl, formyl, (C_2–C_5)alkanoyl; or



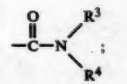
R^1 and R^2 are taken together with the nitrogen to which they are attached to form a pyrrolidine, piperidine, perhydroazepine, morpholine, piperazine, homopiperazine, indoline, isoindoline, 1,2,3,4-tetrahydroquinoline, 1,2,3,4-tetrahydroisoquinoline or



ring system; or one of said ring systems substituted on aliphatic, aromatic or heterocyclic carbon with (C_1–C_4)alkyl, phenyl, hydroxy, hydroxymethyl, 2-hydroxyethyl, (C_1–C_4)alkoxy, (C_2–C_5)alkanoyloxy, carbamoyloxy, formamido, (C_2–C_5)alkanecarboxamido, (C_1–C_4)alkanesulfonamido,



on heterocyclic nitrogen with (C_1–C_4)alkyl, phenyl, (C_7–C_9)phenylalkyl, pyridyl, 2-hydroxyethyl, formyl, (C_2–C_5)alkanoyl; or



R^3 and R^4 are taken separately and are each hydrogen, (C_1–C_4)alkyl or phenyl; or R^3 and R^4 are taken together with the nitrogen to which they are attached to form a pyrrolidine, piperidine, morpholine, or 4-[(C_1–C_3)alkyl or phenyl]piperazine ring;

with the provisos that in said group —NR^1R^2 (a) there is no tetrahedral carbon atom which is simultaneously bonded to two of the same or different atoms selected from the group consisting of nitrogen, oxygen or sulfur and (b) when both of R^1 and R^2 are other than hydrogen, then the carbons of R^1 and R^2 which are adjacent to the nitrogen branch point are substituted with a total of at least two hydrogens;

a pharmaceutically acceptable cationic salt when the compound contains a carboxylic acid group; or

a pharmaceutically acceptable acid addition salt when the compound contains a basic nitrogen atom.

4,797,395

1-ACYLOXYALKYL ESTERS OF CEPHALOSPORIN

Akio Miyake; Yoshinobu Yoshimura, and Mitsuo Numata, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 616,402, Jun. 1, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 886,814

Claims priority, application Japan, Jun. 2, 1983, 58-99213; Sep. 21, 1983, 58-175496

Int. Cl.[4] A61K *31/545*; C07D *501/36*

U.S. Cl. 514—206 **6 Claims**

1. A compound, namely 1-(phenylacetoxy)-2-methylpropyl 7β-[2-(2-aminothiazol-4-yl)acetoamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl]thio]methyl]ceph-3-em-4-carboxylate, or a pharmaceutically acceptable salt thereof.

4. A compound, namely 1-(cyclohexylcarbonyloxy)butyl 7β-[2-(2-aminothiazol-4-yl)acetoamido]-3-[[[1-(2-dimethylaminoethyl)-1H-tetrazol-5-yl-]thio]methyl]ceph-3-em-4-carboxylate, or a pharmaceutically acceptable salt thereof.

4,797,396

β-LACTAM DERIVATIVES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

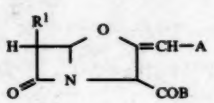
Paul E. Finke, Milltown; Morris Zimmerman, Watchung; James B. Doherty, New Milford; Bonnie Mae Ashe, Scotch Plains, and Conrad P. Doru, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 627,166, Jul. 2, 1984, Pat. No. 4,711,886. This application Jul. 16, 1987, Ser. No. 74,440

Int. Cl.[4] C07D *487/04*; A61K *31/42*

U.S. Cl. 514—210 **3 Claims**

1. A method of treating or managing elastase-mediated diseases comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula:



wherein

A is
- (a) hydrogen;
- (b) C_{1-6} alkyl;
- (c) phenyl;
- (d) OR;
- (e) halo;
- (f) OCOR;

R is
- (a) hydrogen;
- (b) C_{1-6} alkyl; or
- (c) phenyl;

R_1 is:
- (1) R'NH wherein R' is
  - (a) hydrogen;
  - (b) CF_3CO or CH_3OCO;
  - (c) C_{1-6} alkyl SO_2; or
  - (d) $C_6H_5CH_2SO_2$;
- (2) hydrogen;
- (3) C_{1-6} alkyl;
- (4) OR;
- (5) SR;
- (6) C_{1-6} hydroxyalkyl;
- (7) C_{1-6} alkoxycarbonyl-C_{1-6} alkyl;
- (8) C_{1-6} alkoxycarbonyloxy-C_{1-6} alkyl;
- (9) benzoxycarbonyloxy-C_{1-6} alkyl; or
- (10) phenoxycarbonyloxy-C_{1-6} alkyl;

B is OB_1 or NHB_1 wherein B_1 is
- (1) benzyl;
- (2) phenyl;
- (3) straight or branched C_{1-6} alkyl;

(4) straight or branched C_{2-8} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) C_{1-6} alkanoyloxy C_{-1-6} alkyl;
(7) C_{1-6} alkanoyl C_{1-6} alkyl;
(8) C_{1-6} alkoxy C_{1-6} alkyl; or
(9) halo=C_{1-6} alkyl;
the above groups (1)–(9) can optionally be substituted by radicals selected from a group consisting of C_{1-6} alkyl, hydroxy, C_{1-6} alkoxy, halo, nitro, mercapto, amino, cyano, carboxy, sulfoamino, carbamoyl, carbamoyloxy, C_{1-6}alkyl or amino sulfonyl, C_{1-6} alkylamino, sulfamoyl, azido, carboxamido or N-C_{1-6} alkylcarboxamido.

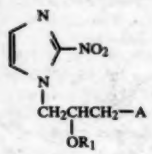
4,797,397

2-NITROIMIDAZOLE DERIVATIVES USEFUL AS RADIOSENSITIZERS FOR HYPOXIC TUMOR CELLS

Mark J. Suto, and Leslie M. Werbel, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

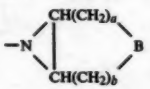
Filed Jul. 31, 1987, Ser. No. 80,280
Int. Cl.[4] C07D *401/12, 233/91;* A61K *31/415, 31/445*
U.S. Cl. 514—212 **24 Claims**

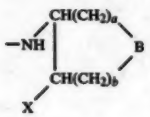
1. A compound having the strutural formula



wherein
R_1 is
hydrogen;
alkanoyl of from two to five carbon atoms; or
benzolyl;
A is selected from substituent groups (a) to (f)

(a)





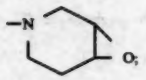
wherein
a is zero, one, or two;
b is one, two, three, or four;
B is
$>CHR_2$,
$>NR_2$, or
>0, and
X is Cl or Br;
R_2 is selected from hydrogen or alkyl of from one to four carbon atoms; phenyl substituted with halogen, hydroxy, or

(c)

-continued

(d)

(e)



(f) $-N_3$, or
a pharmaceutically acceptable acid addition salt thereof,

24. A method of sensitizing hypoxic tissues to X-irradiation therapy comprising administering to a patient, prior to receiving said therapy, a radiation-sensitizing effective amount of a compound as defined by claim 1.

4,797,398

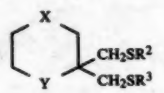
MORPHOLINE COMPOUNDS, COMPOSITIONS AND USE

Michael D. Turnbull, Reading, and Ian T. Kay, Penzance, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 068,526, Jul. 1, 1987, Pat. No. 4,746,677, which is a division of Ser. No. 941,101, Dec. 12, 1986, Pat. No. 4,696,926. This application Jan. 25, 1988, Ser. No. 148,020
Claims priority, application United Kingdom, Dec. 19, 1985, 8531284; Dec. 19, 1985, 8531285
Int. Cl.[4] A01N *43/84;* C07D *265/30*
U.S. Cl. 514—237.5 **4 Claims**

1. A compound of formula (IA):

(IA)



or a salt thereof;
wherein one of X or Y is oxygen and the other is NR^1 where
(b) R^1 is alkyl, aralkyl or acyl; and R^2, and R^3 are independently selected from nitrile, $CONH_2$ and SO_2R^4 wherein R^4 is optionally substituted aryl, optionally substituted alkyl, aralkyl or cycloalkyl.

3. An insecticidal or nematocidal composition comprising a compound of formula (I) as defined in claim 1 in combination with an agriculturally acceptable carrier.

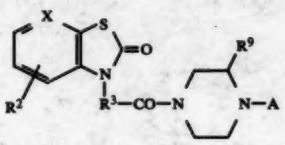
4,797,399

PIPERAZINE COMPOUNDS AND ANTITHROMBOTIC PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Ikuo Ueda; Masaaki Matsuo, both of Toyonaka; Kiyoshi Tsuji, Kishiwada; Hiroyuki Okumura, Ibaraki, and Osamu Nakaguchi, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 23, 1986, Ser. No. 945,853
Claims priority, application United Kingdom, Jan. 17, 1986, 8601160
Int. Cl.[4] A61K *31/495, 31/44;* C07D *513/00, 513/06*
U.S. Cl. 514—253 **6 Claims**

1. A compound of the formula:



wherein
R^2 is halogen,
R^3 is lower alkylene,
R^9 is hydrogen or lower alkyl,
X is CH or N, and
A is hydrogen, a group of the formula:

wherein R^6 and R^7 are each hydrogen, lower alkanoyl or lower alkaneimidoyl, or a group of the formula: $-N=R^8$ wherein R^8 is lower alkylidene,
or a pharmaceutical acceptable salt thereof.

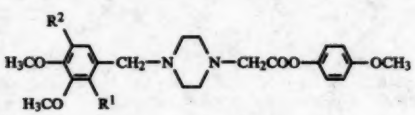
6. A method for the treatment of thrombosis in a human being or animal comprising administering an effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof.

4,797,400
PIPERAZINE COMPOUNDS AND ANTI-ULCER COMPOSITION CONTAINING THE SAME

Hiroshi Ohtaka; Kenji Yoshida, both of Osaka; Kenji Sukuzi, Nara; Koichi Shimohara, Neyagawa; Sigeru Tajima, and Keizo Ito, both of Osaka, all of Japan, assignors to Kanebo, Ltd., Japan

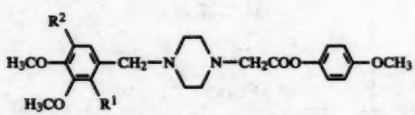
Filed Jun. 16, 1987, Ser. No. 62,573
Claims priority, application Japan, Jun. 23, 1986, 61-147789
Int. Cl.[4] A61K *31/495;* **C07D** *295/14*
U.S. Cl. 514—255 **6 Claims**

1. A piperazine compound of the formula:



wherein either one of R^1 and R^2 is methoxy group and another is hydrogen atom, or a pharmaceutically acceptable acid addition salt thereof.

4. A pharmaceutical composition for the prophylaxis and treatment of peptic ulcers, which comprises as an active ingredient a therapeutically or prophylactically effective amount of a piperazine compound of the formula:



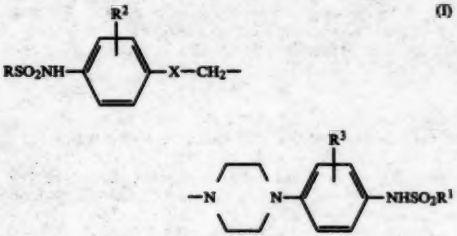
wherein either one of R^1 and R^2 is methoxy group and another is hydrogen atom, or a pharmaceutically acceptable acid addition salt thereof in admixture with a pharmaceutically acceptable carrier or diluent.

4,797,401
4-SUBSTITUTED-1-(4-ALKYLSULPHONAMIDO-PHENYL)PIPERAZINES AS ANTIARRHYTHMIC AGENTS

John E. G. Kemp, and Peter E. Cross, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 15, 1987, Ser. No. 73,535
Claims priority, application United Kingdom, Aug. 9, 1986, 8619472
Int. Cl.[4] A61K *31/495;* **C07D** *241/04*
U.S. Cl. 514—255 **4 Claims**

1. A process for the prevention or reduction of cardiac arrhythmias in a human being which comprises administering to said human being a cardiac arrhythmia preventing or reducing amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein
R and R^1, which are the same or different, are C_1–C_4 alkyl;
R^2 and R^3, which are the same or different, are H, halo or C_1–C_4 alkyl; and
X is $-CH_2-$,

or —CH(OH)—.

4,797,402
COOLING ANTI-ITCH SKIN PREPARATIONS

Kenneth E. Dorsey, 8821 Bluff Wood La., Fort Washington, Md. 20744

Filed Jun. 2, 1987, Ser. No. 56,692
Int. Cl.[4] A61K *31/56, 9/06*
U.S. Cl. 514—171 **7 Claims**

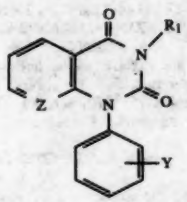
1. A hydrophilic ointment petrolatum base composition for the topical adminstration of an antiflammatory corticosteroid which provides a cooling effect and anti-itching characterisitcs consisting essentially of:
an antiflammatory effective amount of a corticosteroid; peppermint oil in amounts of from about 0.01 to about 0.05% by weight; urea in amounts of from about 5.0 to about 10.0% by weight; and an oil soluble surfactant selected from hydroxylated lanolin, ethoxylated lanolin or polyoxyethylene esters, based on the weight of the composition.

4,797,403
QUINAZOLINEDIONES AND PYRIDOPYRIMIDINEDIONES

John A. Lowe, III, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 1,718, Aug. 21, 1986. This application Jul. 23, 1987, Ser. No. 76,976
Int. Cl.[4] C07D *293/96, 471/04;* **A61K** *31/505*
U.S. Cl. 514—259 **7 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

R_1 is benzyl;

Y is carboxy, carboalkoxy wherein the alkoxy has 1 to 6 carbon atoms, carbobenzyloxy, carbamoyl, N-alkylcarbamoyl wherein the alkyl has 1 to 6 carbon atoms, CO_2M wherein M is a pharmaceutically acceptable cation, or

Z is CH.

4,797,404

PHARMACEUTICAL PREPARATION COMPRISING CO-DERGOCRINE AND A CALCIUM ANTAGONIST

Dieter Welzel, and Hans Bühlmann, both of Nuremberg, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 889,160, Jul. 25, 1986, abandoned, which is a continuation of Ser. No. 775,985, Sep. 13, 1985, Pat. No. 4,617,306, which is a continuation of Ser. No. 723,948, Apr. 16, 1985, abandoned, which is a continuation of Ser. No. 601,496, Apr. 18, 1984, abandoned. This application Dec. 1, 1987, Ser. No. 126,663

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314607

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 **19 Claims**

1. A method of treating hypertension comprising co-administering to a subject in need of such treatment:

(a) co-dergocrine or a pharamceutically acceptable acid addition salt thereof; and

(b) as a calcium antagonist, a compound selected from the group consisting of

4-(2,1,3-benzoxadiazol-4-yl)-1,4-dihydro-2,6-dimethyl-3-ethoxycarbonyl-5-pyridine carboxylic acid ethyl ester,

4-(2,1,3-benzthiadiazole-4-yl)-1,4-dihydro-2,6- -dimethyl-3-methoxycarbonyl-5-pyridine carboxylic acid methyl ester and 4-(2,1,3-benzoxadiazol-4-yl)-1,4-dihydro-2,6-dimethyl-3-isopropoxycarbonyl-5-pyridine carboxylic acid methyl ester;

said components (a) and (b) being co-administered in a ratio of 1:1 to 1:50 p.p.w.

4,797,405

STABILIZED PERGOLIDE COMPOSITIONS

James W. Conine, and Julian L. Stowers, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 26, 1987, Ser. No. 112,360

Int. Cl.[4] A61K *31/48*; C07D *457/02*

U.S. Cl. 514—288 **10 Claims**

1. A pharmaceutical composition of pergolide or a salt thereof stabilized to decomposition by light comprising a therapeutically effective amount of pergolide or a salt thereof, a stabilizing agent selected from polyvinylpyrrolidone, α-tocopherol succinate and propyl gallate in an amount sufficient to effect stabilization to decomposition by light and pharmaceutically acceptable excipients.

6. A method of stabilizing a pharmaceutical composition of pergolide or a salt thereof to decomposition by light comprising incorporating into said pharmaceutical composition, in addition to a therapeutically effective amount of said pergolide or a salt thereof and pharmaceutically acceptable excipients, a stabilizing agent selected from polyvinylpyrrolidone, α-tocopherol succinate and propyl gallate in an amount sufficient to effect stabilization to decomposition by light.

4,797,406

AMIDES AND ESTERS CONTAINING BRIDGED PIPERIDINES AND USE AS SEROTONIN M ANTAGONISTS

Brian P. Richardson, Magden, Switzerland; Günter Engel, Weil, Fed. Rep. of Germany; Rudolf K. A. Giger, Riehen, and Andrea Vasella, Meilen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

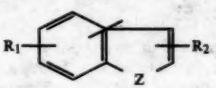
Continuation of Ser. No. 644,810, Aug. 27, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,756

Claims priority, application Switzerland, Aug. 26, 1983, 4675/83; Nov. 3, 1983, 5933/83; Dec. 23, 1983, 6877/83

Int. Cl.[4] A61K *31/445*; C07D *401/12, 405/12, 221/22*

U.S. Cl. 514—299 **9 Claims**

1. A compound of formula A-B-C-D wherein A is a group of formula (a)



(a)

wherein the free valence is attached to either of the fused rings,

Z is $—CH_2—$, $—NR_3—$, —O— or —S—;

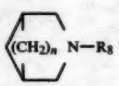
R_1 and R_2, independently, are hydrogen, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, amino, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, mercapto or (C_{1-4})alkylthio;

R_3 is hydrogen, (C_{1-4})alkyl, (C_{3-5})alkenyl, unsubstituted phenyl, phenyl mono- or polysubstituted by (C_{1-4})alkyl, halogen, hydroxy or (C_{1-4})alkoxy, or unsubstituted phenyl (C_{1-4})alkyl;

B is —CO— or $—SO_2—$;

C is —O— or —NH—; and

D is a group of formula (f)



(f)

where R_8 is hydrogen, (C_{1-7})alkyl, (C_{3-5})alkenyl unsubstituted phenyl$(C_1$-$4)$alkyl/mono- or poly-substituted on the phenyl moiety thereof by (C_{1-4})alkyl, halogen, hydroxy or (C_{1-4})alkoxy; and n=2, 3 or 4 or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

9. A method of inducing a serotonin M receptor antagonist effect comprising administering to a subject in need of such treatment a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

4,797,407

FUNGICIDAL PYRIDYL CARBAMATES

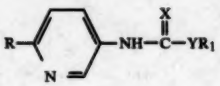
Don R. Baker, Orinda, and Keith H. Brownell, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Filed Oct. 29, 1987, Ser. No. 114,810

Int. Cl.[4] C07D *213/75*; A01N *43/40*

U.S. Cl. 514—346 **9 Claims**

1. A compound having the structural formula



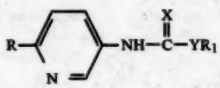
wherein

R is selected from the group consisting of halogen, C_1–C_3 alkoxy, —CF_3, C_3–C_4 alkenyloxy and C_1–C_3 haloalkoxy;

R_1 is selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 cycloalkyl, benzyl, C_1–C_3 haloalkyl, and C_3–C_8 cyclic, straight or branched alkoxyalkyl;

X is either oxygen or sulfur; Y is either oxygen or sulfur; or a fungicidally acceptable organic or inorganic salt thereof.

6. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein

R is selected from the group consisting of halogen, C_1–C_3 alkoxy, —CF_3, C_3–C_4 alkenyloxy and C_1–C_3 haloalkoxy;

R_1 is selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 cycloalkyl, benzyl, C_1–C_3 haloalkyl, and C_3–C_8 cyclic, straight or branched alkoxyalkyl;

X is either oxygen or sulfur; Y is either oxygen or sulfur; or a fungicidally acceptable organic or inorganic salt thereof.

4,797,408

COCKROACH REPELLENTS

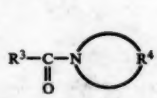
Terrence P. McGovern, Bowie, Md., and George S. Burden, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 625,329, Jun. 27, 1984, Pat. No. 4,621,143. This application Sep. 5, 1986, Ser. No. 875,911

Int. Cl.[4] A01N *43/40*

U.S. Cl. 514—315 **12 Claims**

1. A method of repelling cockroaches consisting essentially of applying to a locus to be protected an effective cockroach repellent amount, in a compatible liquid or solid carrier, a compound of the formula



wherein R^3 is one of the following groups:

a. branched-chain alkyl having 3 to 9 carbon atoms;

b. straight-chain alkenyl having 2 to 8 carbon atoms;

c. branched-chain alkenyl having 3 to 8 carbon atoms;

d. halogen-substituted straight-chain alkyl having 1 to 3 carbon atoms;

e. halogen-substituted branched-chain alkyl having 3 carbon atoms;

f. halogen-substituted straight-chain alkenyl having 1 to 3 carbon atoms;

g. halogen-substituted branched-chain alkenyl having 3 carbon atoms; or

h. alicyclic ring structure having 3 or 4 carbon atoms, unsubstituted or substituted with lower alkyl;

wherein R^4 is one of the following groups:

a. C_5 alkylene; or

b. lower alkyl substituted C_5 alkylene.

4,797,409

1-HYDROXY-2-PYRIDONES, A PROCESS FOR THEIR PREPARATION, AND MEDICAMENTS WHICH CONTAIN THEM, AND INTERMEDIATES FORMED IN THE PREPARATION OF THE 1-HYDROXY-2-PYRIDONES

Gerhard Lohaus, Kelkheim; Walter Dittmar, Hofheim am Taunus; Heinz Hänel, Bad Homburg; Wolfgang Raether, Dreieich; Dieter Reuschling, Butzbach, and Bengt-Thomas Gröbel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

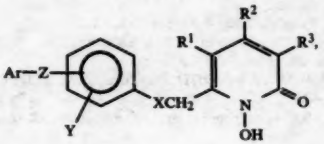
Filed Apr. 16, 1987, Ser. No. 38,903

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613061; Aug. 2, 1986, 3626211

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—345 **15 Claims**

1. A 1-hydroxy-2-pyridone of the formula I



I

in which

R^1, R^2 and R^3, which are identical or different, denote hydrogen or lower alkyl having 1–4 carbon atoms,

X denotes S or O,

Y denotes hydrogen or up to 2 halogen atoms selected from chlorine and bromine,

Z denotes a single bond or the bivalent radicals O, S, —C(R-)$_2$— wherein R is H or C_1–C_4-alkyl, or denotes other bivalent radicals with 2–10 carbon atoms linked to form a chain or said other bivalent radicals containing 2–10 carbon atoms and oxygen or sulfur atoms linked to form a chain, with the proviso that when the radicals contain 2 or more oxygen or sulfur atoms, said oxygen or sulfur atoms are separated by at least 2 carbon atoms, or denotes said other bivalent radicals having 2 adjacent carbon atoms linked together by a double bond, with the free valencies of the carbon atoms being saturated by H or C_1–C_4-alkyl groups,

Ar denotes a fused or an isolated aromatic ring system selected from the group consisting of phenyl, naphthyl, tetrahydronaphthyl, indenyl, biphenyl, diphenylalkane, diphenylether and diphenylthioether, or said fused or isolated aromatic ring system substituted by up to three radicals selected from the group consisting of fluorine, chlorine, bromine, methoxy, C_1–C_4-alkyl, trifluoromethyl and trifluoromethoxy.

13. A compound as claimed in claim 1, wherein R^1 and R^3 denote hydrogen.

4,797,410

SUPPRESSION OF WITHDRAWAL SYMPTOMS IN OPIOID-INDUCED TOLERANCE OR DEPENDENCE

Esam E. El-Fakahany, West Minster, Md., assignor to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 733,664, May 13, 1985, abandoned. This application Apr. 16, 1987, Ser. No. 40,755

Int. Cl.[4] A61K *31/44, 31/275, 31/135*

U.S. Cl. 514—356 **6 Claims**

1. A method for suppressing withdrawal symptoms in an opioid-induced tolerant or physically dependent individual, said withdrawal symptoms selected from the group consisting of:

(a) the sympathetic effects of lacrimation, rhinorrhea, sweating, piloerection, dilated pupils and elevated pulse rate;

(b) parasympathetic effects;

(c) behavioral hyperexcitability;
(d) muscle and joint pain; and
(e) ptosis,
said method comprising administering to said individual an effective amount of a 1,4-dihydropyridine calcium channel blocking drug or a pharmaceutically acceptable non-toxic salt thereof to suppress said withdrawal symptoms in said individual.

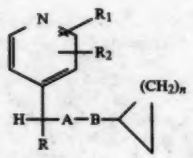
4,797,411

CYCLOALKYL-SUBSTITUTED 4-PYRIDYL DERIVATIVES AND USE AS AROMATASE INHIBITORS

Angelo Crugnola, Varese; Enrico di Salle, and Paolo Lombardi, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jul. 13, 1987, Ser. No. 72,678
Claims priority, application United Kingdom, Jul. 18, 1986, 8617596; Nov. 24, 1986, 8628029
Int. Cl.[4] A61K *31/44;* **C07D** *213/26, 213/28, 213/24*
U.S. Cl. 514—357 **17 Claims**

1. A cycloalkyl-substituted 4-pyridyl derivative of formula (I)



(I)

wherein
R is C_1–C_4 alkyl;
each of R_1 and R_2 is, independently, hydrogen or C_1–C_4 alkyl;
n is an integer of 1 to 5; and either
(a) A is >C=O and B is —O—, —NH— or —CH_2—; or
(b) A is —CH_2— and B is —O—, —NH—, —CH_2— or >C=O; or
(c) A is —O— and B is >C=O or —CH_2—; or
(d) A is —NH— and B is >C=O or —CH_2—,
and the pharmaceutically acceptable salts thereof.

11. Method of producing inhibition of the enzyme aromatase in a patient in need of it, which method comprises administering to the patient an effective amount of a compound according to claim 1.

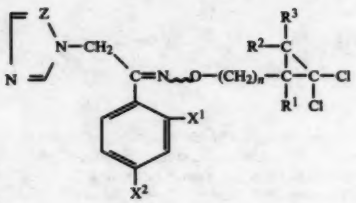
4,797,412

FUNGICIDAL SUBSTITUTED CYCLOPROPYL OXIME ETHERS

Hans-Joachim Knops, Monheim, Fed. Rep. of Germany; Karl Steinbeck, Kansas City, Mo.; Karl H. Büchel, Burscheid, Fed. Rep. of Germany; Wilhelm Brandes, Leichlingen, Fed. Rep. of Germany, and Paul Reinecke, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,154
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545085
Int. Cl.[4] A01N *43/653;* **C07D** *249/08*
U.S. Cl. 514—383 **7 Claims**

1. A substituted cyclopropyl oxime ether of the formula



in which
z represents a nitrogen atom,
X^1 represents chlorine,
X^2 represents chlorine or hydrogen,
R^1, R^2 and R^3 independently of one another represent hydrogen, methyl or chlorine and
n represents an integer from 1 to 4,
or an addition product thereof with an acid or metal salt.

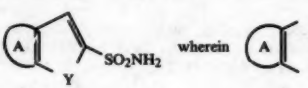
4,797,413

THIENO THIOPYRAN SULFONAMIDE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND USE

John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale, and Marcia E. Christy, Collegeville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 863,225, May 14, 1986, Pat. No. 4,677,115, which is a continuation-in-part of Ser. No. 777,654, Sep. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,684, Dec. 12, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 67,326
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/38, 31/535;* **C07D** *495/04*
U.S. Cl. 514—432 **13 Claims**

1. A compound of structural formula:



wherein A is

or a pharmacologically acceptable salt thereof, wherein:
X is —S—, —SO—, or —SO_2—;
Y is —S—, C_{1-3}alkyl or benzyl,
m is 1
R^{13} is
(a) hydrogen,
(b) phenyl either unsubstituted or substituted with one or more of
(1) hydroxy,
(2) C_{1-3}alkoxy,
(3) $R^{17}R^{18}N$-C_{1-5}alkyl, wherein R^{17} and R^{18} are independently selected from:
(i) hydrogen or
(ii) C_{1-5}alkyl, or taken together with the nitrogen to which they are attached form a heterocycle selected from morpholine, piperidine, pyrrolidine, and piperazine,
(c) —OH,
(d) =O; or
(e) $-NR^{17}R^{18}$

R^{14} is
(a) hydrogen,
(b) —CN,
(c) phenyl-C_{1-3}alkyl, wherein the phenyl is either unsubstituted or substituted with one or more of
(1) hydroxy,
(2) C_{1-3}alkoxy, or
(3) $R^{17}R^{18}N$-C_{1-5}alkyl;
R^{15} is
(a) hydrogen,
(b) C_{1-5}alkyl,
(c) phenyl-C_{1-3}alkyl, wherein the phenyl is either unsubstituted or substituted with on or more of:
(1) hydroxy,
(2) C_{1-3}alkoxy,
(3) $R^{17}R^{18}N$-C_{1-3}alkyl,
(d) phenyl either unsubstituted or substituted with one or more of
(1) hydroxy,
(2) C_{1-3}alkoxy,
(3) $R^{17}R^{18}N$-C_{1-3}alkyl, or
(4) chloro or fluoro
(e) aromatic heterocycle of 5 or 6 members selected from furyl, pyridyl, and thienyl either unsubstituted or substituted with $R^{17}R^{18}N$-C_{1-3}alkyl,
(f) —$NR^{17}R^{18}$; and
(g) C_{2-5}alkyl substituted with —$NR^{17}R^{18}$
R^{16} is
(a) hydrogen, or
(b) C_{1-3}alkyl,
with the proviso that if R^{13} is other than phenyl or substituted phenyl and R^{14} is hydrogen, one of R^{15} and R^{16} is other than hydrogen.

8. An ophthalmological formulation for the treatment of ocular hypertension comprising an ophthalmologically acceptable carrier and an effective ocular antihypertensive amount of a compound of claim 1.

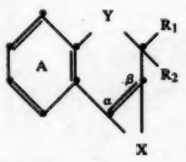
4,797,414

NAPHTHOTHIOPHENE DERIVATIVES AND THEIR USE AS RESPIRATORY ENHANCING AGENTS

Christian G. Rimbault, Grand-Lancy, Switzerland, assignor to Zyma SA, Nyon, Switzerland

Filed Feb. 14, 1986, Ser. No. 829,631
Claims priority, application United Kingdom, Feb. 23, 1985, 8504702
Int. Cl.[4] A61K *31/38*; C07D *333/74*
U.S. Cl. 514—443 **22 Claims**

1. A compound of the formula



(I)

wherein ring A is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, lower alkylenedioxy, lower alkanoyloxy, halogen, lower alkylamino, di-lower alkylamino, lower alkanoylamino, lower alkanoyl, carboxy and lower alkoxycarbonyl, R_1 and R_2, independently of one another, each represents hydrogen, lower alkyl or phenyl which is unsubstituted or substituted in the same manner as indicated above for the ring A, Y is methylene, oxygen or sulfur, X represents a bivalent radical —S—C(—B—$(Z)_n$)=CH— the sulfur group S of which is bound directly to the alpha- or to the β-position of the bicyclic ring system, B denotes a direct bond, lower alkylene or lower alkenylene, n is 1 or, in the case where B is lower alkylene or lower alkenylene, may also be 2 or 3, and Z represents carboxy, alkoxycarbonyl, carbamoyl which is unsubstituted or substituted by one or two equal or different radicals selected from the group consisting of (a) lower alkyl; (b) phenyl-lower alkyl, the phenyl group in turn being unsubstituted or substituted in the same manner as indicated above for the ring A; (c) amino; (d) lower alkylamino; and (e) di-lower alkylamino; esterified or amidated carboxy that can be cleaved under physiological conditions selected from lower alkanoyloxy-methoxycarbonyl, amino-lower alkanoyloxymethoxycarbonyl, lower alkanoylamino-methoxycarbonyl, 3-phthalidyloxycarbonyl, 1-lower alkoxycarbonyloxy-lower alkoxycarbonyl, 1-lower alkoxy-lower alkoxycarbonyl, 2-oxo-1,3-dioxolen-4-yl methoxycarbonyl that is unsubstituted or substituted by lower alkyl or phenyl in the 5-position of the dioxolene ring, and carboxymethylcarbamoyl; cyano, hydroxycarbamoyl, 5-tetrazolyl, unsubstituted or lower alkyl-substituted 4,5-dihydro-2-oxazolyl, formyl, iminomethyl which is unsubstituted or substituted by hydroxy, lower alkoxy, or lower alkanoyloxy, or lower alkanoyl which is unsubstituted or substituted by halogen, or benzoyl or phenyl-lower alkanoyl each of which is unsubstituted or substituted in the phenyl ring as indicated above for the ring A, sulfo, lower alkoxysulfonyl, sulfamoyl, lower alkylsulfamoyl, di-lower alkylsulfamoyl, hydroxy, lower alkoxy, alkanoyloxy, amino, lower alkylamino, di-lower alkylamino, lower alkyleneamino, N-morpholino, N-thiomorpholino, N-piperazino which is unsubstituted or substituted by lower alkyl at its 4-position nitrogen atom, lower alkanoylamino, halo-lower alkanoylamino, nitro or halogen; with the provisos

(a) that R_1 is phenyl unsubstituted or substituted as defined above, if R_2 represents hydrogen, Y denotes methylene and X is (alpha)—S—C(—Z)=CH—(β) wherein Z denotes carboxy or said esterified or amidated carboxy as defined above,
(b) that ring A is substituted as defined above, if R_1 and R_2 both are hydrogen Y represents oxygen or sulfur and X is (alpha)—S—C(—COOH)=CH—(β), and
(c) that Y is oxygen or sulfur, if R_1 and R_2 both are hydrogen, X is (alpha)—S—C(—Z)=CH—(β) wherein Z denotes carboxy, ethoxycarbonyl, cyano, formyl, acetyl, nitro or bromo, and ring A is unsubstituted or monosubstituted in 7-position by methoxy or acetyl;

or a tautomer, a stereoisomer or an optical isomer thereof, or a mixture of optical isomers; or a pharmaceutically acceptable salt thereof.

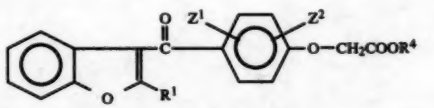
4,797,415

BENZOFURAN DERIVATIVES AND USE THEREOF FOR TREATING HYPERURICEMIA

Tsuyoshi Tomiyama; Akira Tomiyama, and Koichi Kubota, all of Nagano, Japan, assignors to Kotobuki Seiyaku Company Limited, Nagano, Japan

Continuation-in-part of Ser. No. 543,292, Oct. 19, 1983, abandoned. This application Jul. 28, 1986, Ser. No. 891,276
Claims priority, application Japan, Oct. 19, 1982, 57-182130
Int. Cl.[4] A61K *31/34*; C07D *307/80*
U.S. Cl. 514—469 **27 Claims**

1. A compound of the formula



wherein:
R^1 is a lower alkyl group,

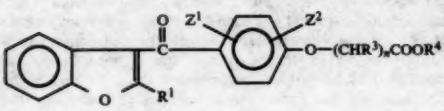
R^4 is hydrogen or a lower alkyl group and

Z^1 and Z^2 are each hydrogen or a lower alkyl group

and pharmaceutically acceptable salts thereof.

17. A method for treating hyperuricemia which comprises administering to a patient suffering from hyperuricemia a compound defined in claim 1.

18. A compound of the formula



wherein:

R^1 is a lower alkyl group,

R^3 is hydrogen or a lower alkyl group,

R^4 is hydrogen or a lower alkyl group and

Z^1 and Z^2 are each hydrogen or a lower alkyl group, with the proviso that at least one of Z^1 and Z^2 is a lower alkyl group and

n is an integer of 1 or 2

and pharmaceutically acceptable salts thereof.

27. A method for treating hyperuricemia which comprises administering to a patient suffering from hyperuricemia a compound defined in claim 18.

4,797,416

FUNGICIDAL CARBANILATES

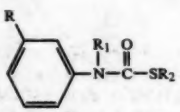
Don R. Baker, Orinda; Keith H. Brownell, Cupertino, and Charles Kezerian, Orinda, all of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Filed Jan. 5, 1987, Ser. No. 607

Int. Cl.[4] C07C *155/02*; A01N *47/10*

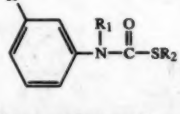
U.S. Cl. 514—485 **17 Claims**

1. A compound having the structural formula



wherein R is methoxy or allyloxy; R_1 is selected from the group consisting of C_2–C_4 alkoxyalkyl and formyl; and R_2 is C_1–C_6 alkyl.

10. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein R is methoxy or allyloxy; R_1 is selected from the group consisting of C_2–C_4 alkoxyalkyl and formyl; and R_2 is C_1–C_6 alkyl.

4,797,417

FURANONE DERIVATIVES, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Masanori Okamoto, Osaka; Itsuo Uchida, Kyoto; Kazuyoshi Umehara, Ashiya; Masanobu Kohsaka, Sakai, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 695,001, Jan. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 508,892, Jun. 29, 1983. This application Mar. 27, 1987, Ser. No. 31,199

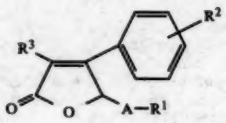
Claims priority, application Japan, Jul. 19, 1982, 57-126599

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] C07D *307/32, 307/34*; A61K *31/365*

U.S. Cl. 514—473 **8 Claims**

1. A compound of the formula:



wherein

A is a lower alkylene group,

R_1 is a carboxy, hydroxy, benzyloxy, or lower alkoxycarbonyl group,

R^2 is a hydrogen or halogen atom or a halo(lower)alkyl group, and

R^3 is a hydrogen atom or a hydroxy, carboxy, lower alkoxy or lower alkoxycarbonyl group, and pharmaceutically acceptable salts thereof.

4,797,418

ANTIBACTERIAL CYANOMETHYL CARBOXYLATES

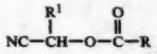
Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 756,904, Jul. 19, 1985, Pat. No. 4,625,045. This application Aug. 12, 1986, Ser. No. 895,651

Int. Cl.[4] A01N *37/34*

U.S. Cl. 514—521 **2 Claims**

1. A method for inhibiting bacteria which comprises contacting said bacteria with a bacteria inhibiting amount of an antibacterial compound of the formula



wherein R represents:

(a) $-CCl_3$;

(b) $-CF_3$;

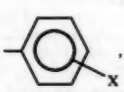
(c) $-CH_2NO_2$;

(d) $-CH_2CN$;

(e) $-CH_2\oplus N(R^2)_3$;

wherein each R^2 is independently alkyl or aryl; or

(f)



wherein X is one to three election-withdrawing groups; and R^1 represents H, alkyl or aryl.

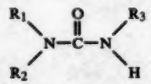
4,797,419

METHOD OF TREATING THE SYMPTOMS OF SENILE COGNITIVE DECLINE EMPLOYING DI- OR TRISUBSTITUTED UREA CHOLINERGIC AGENTS

Walter H. Moos, and Anthony J. Thomas, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 3, 1986, Ser. No. 926,162
Int. Cl.[4] A61K *31/17*
U.S. Cl. 514—588 14 Claims

1. A method of alleviating cholinergic deficits that accompany aging or dementia comprising administering to a patient suffering therefrom an effective amount of a compound having the formula



wherein R_1, R_2 and R_3 are each independently hydrogen; straight or branched alkyl of from one to twenty carbon atoms; straight or branhed alkenyl of from two to twenty carbon atoms; straight or branched alkynyl of from two to twenty carbon atoms; cycloalkyl of from three to eight carbon atoms; phenyl; phenyl substituted with alkyl of from one to four carbon atoms, alkyloxy of from one to four carbon atoms, chlorine, bromine, hydroxyl, nitro, $-SO_3H$, $-SO_3$-alkyl (wherein alkyl is from one to four carbon atoms), independently hydrogen or alkyl of from one to four carbon atoms, trifluoromethyl, or NR_4R_5 where R_4 and R_5 are independently hydrogen or alkyl of from one to four carbon atoms or trifluoromethyl; with the proviso that only one of R_1, R_2 or R_3 may be hydrogen at any time.

4,797,420

DISINFECTANT FORMULATION AND METHOD OF USE

James A. Bryant, Jennings, La., assignor to Jabco Manufacturing, Inc., Lake Arthur, La.

Continuation of Ser. No. 06/775,030, Sep. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 06/649,793, Aug. 14, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 25,666
Int. Cl.[4] A01N *33/12;* A61K *31/14*
U.S. Cl. 514—643 10 Claims

1. A quick drying virucide formulation for killing microroganisms selected from the group consisting of herpes simplex type 1 and herpes simplex type 2 comprising a mixture consisting essentially of about 0.2 to about 10 by weight of alkyl (58% C_{14}, 28 C_{16}, 14% C_{12}) dimethyl benzyl ammonium halide, 20 to 90% by weight of a lower C_1–C_4 aliphatic alcohol, 0.1 to 10% by weight of nonionic surfactant formed by condensing a compound selected from the group consisting of an alkyl phenol, an alkyl amine, an aliphatic alcohol or a fatty acid with ethylene oxide, and a remainder of water.

4,797,421

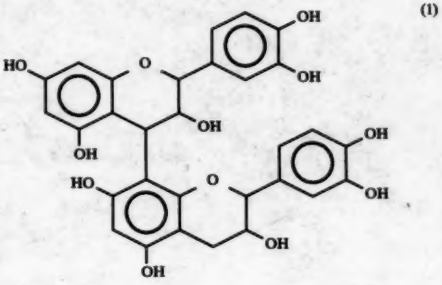
ANTIOXIDANT COMPRISING PROANTHOCYANIDIN AS PRINCIPAL COMPONENT

Toshiaki Ariga, Noda; Ikunori Koshiyama, Nagareyama, and Danji Fukushima, Omiya, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Continuation of Ser. No. 798,620, Nov. 15, 1985, abandoned. This application Sep. 22, 1987, Ser. No. 102,805
Int. Cl.[4] A23D *5/04;* A61K *7/00*
U.S. Cl. 514—844 4 Claims

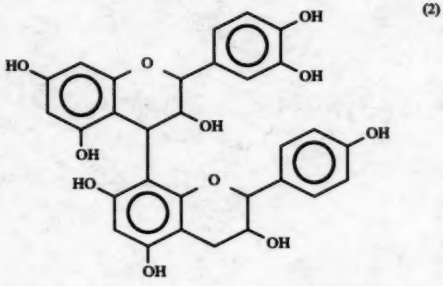
2. A method for inhibiting the oxidation of fats and oils in food compositions and cosmetric preparations which comprises adding to said food compositions or cosmetic preparations about 0.001 to 2% by weight of a proanthocyanidin compound which exhibits an antioxidant action, said proanthocyanidin compound being selected from the group consisting of

a dimeric procyanidin B-2 and its stereoisomers represented by formula (1)



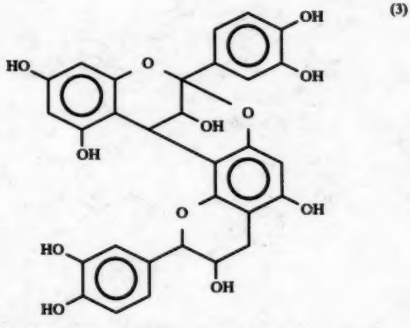
(1)

a dimeric procyanidin represented by formula (2)



(2)

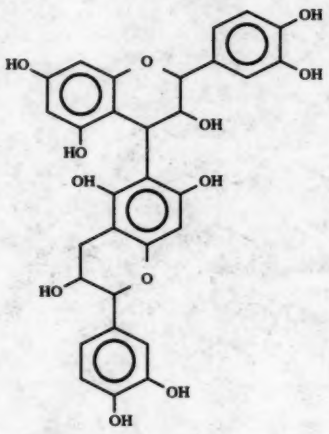
a dimeric proanthocyanidin A-2 and its stereoisomers represented by formula (3)



(3)

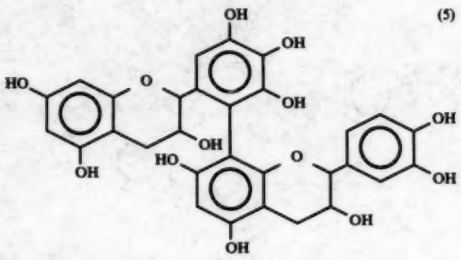
a dimeric procyanidin represented by formula (4)

(4)



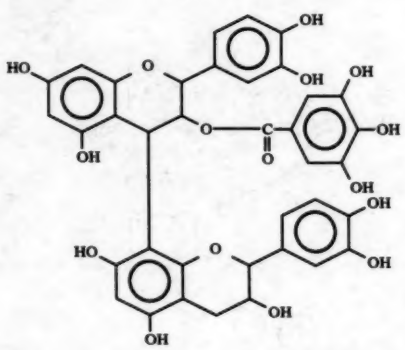
a dimeric prodelphinidin represented by formula (5)

(5)



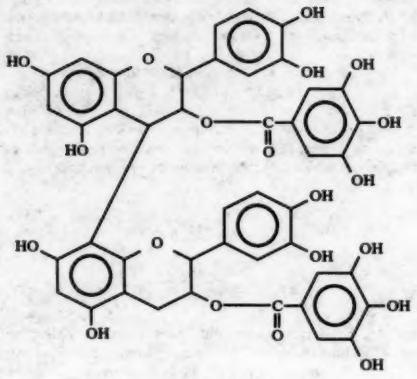
a dimeric procyanidin B-1 gallate and its stereoisomers represented by formula (6)

(6)



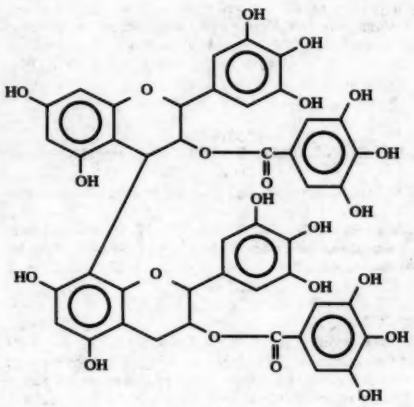
a dimeric procyanidin B-1 gallate and its stereoisomers represented by formula (7)

(7)



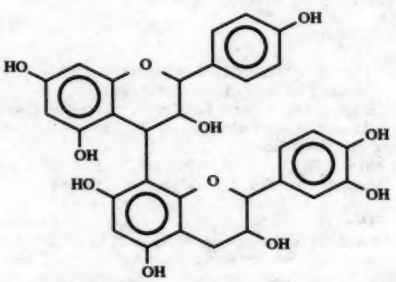
a dimeric prodelphinidin B-2 gallate and its stereoisomers represented by formula (8)

(8)



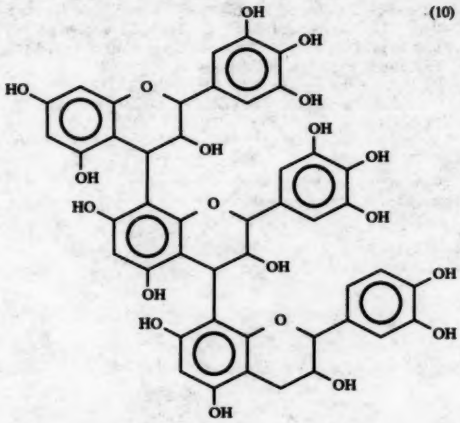
a dimeric propelargonidin represented by formula (9)

(9)



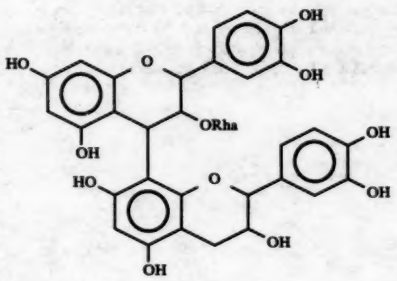
a trimeric prodelphinidin represented by formula (10)

(10)



a dimeric procyanidin represented by formula (11)

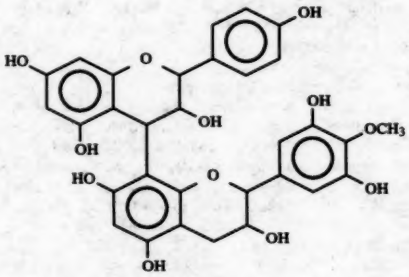
(11)



wherein Rha is rhamnose

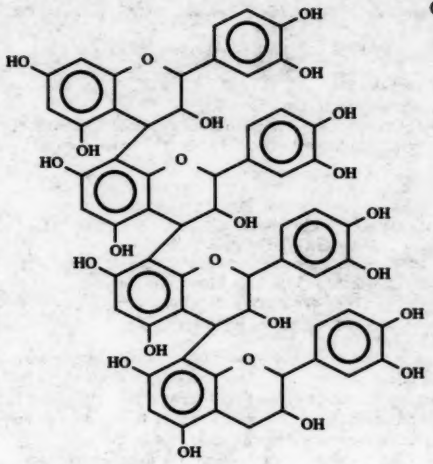
a propelargonidin represented by formula (12)

(12)



a tetrameric proanthocyanidin represented by formula (13)

(13)



and mixtures thereof.

4,797,422

PHARMACEUTICAL COMPOUNDS EFFECTIVE AGAINST SEVERAL DISORDERS OF THE EYE IN PARTICULAR THE CATARACT AND COMPOSITION CONTAINING THEM

Michele Testa, 30 Via Guantai Nuovi, 80133 Naples, Italy

Filed Jul. 23, 1986, Ser. No. 888,348

Claims priority, application Italy, Aug. 5, 1985, 48447 A/85; Oct. 23, 1985, 22596 A/85

Int. Cl.[4] A61K *31/045*

U.S. Cl. 514—912 **14 Claims**

1. A method for the treatment of cataracts of the eye in humans and animals, which comprises topically administering to the eye of a human or animal in need thereof an anti-cataract effective amount of a compound of the formula

$$R—C_6H_4—(CH_2)_n—OH$$

wherein R is hydrogen, alkyl of 1 to 6 carbon atoms, amino, monosubstituted amino, disubstituted amino, or hydroxyl, and n is a whole number of from 1 to 6.

4,797,423

LYSINE SALT OF 4-DIPHENYLACETIC ACID AND ITS OPHTHALMIC FOMULATIONS

Giuseppe Benanti, Santa'Agata Li Battisti, Italy, assignor to S.I.F.I. Societa Industria Farmaceutica Italiana S.p.A., Catania, Italy

Filed Sep. 22, 1987, Ser. No. 99,597

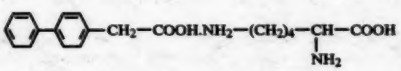
Claims priority, application Italy, Sep. 26, 1986, 21828 A/86

Int. Cl.[4] C07C *101/26*; A61K *31/13*

U.S. Cl. 514—914 **1 Claim**

1. An ophthalmic therapeutic composition, comprising:

a therapeutically effective amount of the lysine salt of 4-diphenylacetic acid of the formula:



in combination with pharmaceutically acceptable excipients.

4,797,424

SALINE SOLUTION FOR FROZEN FOAM

Nancy G. Abt, 9397 Midnight Pass Rd., #404S, Sarasota, Fla. 34242

Filed Feb. 19, 1988, Ser. No. 157,598
Int. Cl.[4] C08J 9/36
U.S. Cl. 521—53 6 Claims

6. A frozen foam comprising:

an open-cell foam material saturated with a saline solution of from 40 to 50 grams of salt to 1 liter of water and frozen.

4,797,425

METHOD OF PRODUCING POROUS MATERIAL HAVING OPEN PORES

Noboru Kishima, and Akio Matsumoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Sep. 3, 1987, Ser. No. 92,585
Int. Cl.[4] C08J 9/28
U.S. Cl. 521—64 6 Claims

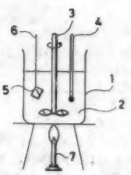
1. A method of producing a porous material having open pores, comprising the steps of preparing an emulsion slurry by vigorously agitating a mixture comprising a main ingredient, a polyamide hardener, a filler and water, casting said emulsion slurry in a water-impermeable mold, hardening said slurry while it contains the water, wherein the improvement comprises that said main ingredient is a bisphenol epoxy resin added with one or more reactive diluent each having one or more epoxy rings per molecule and added in an amount of 27–50 wt %, based on 100 wt % of said bisphenol epoxy resin.

4,797,426

HARD POLYVINYL CHLORIDE RESIN COMPOSITION AND OPEN-CELL FOAM MADE OF SAID COMPOSITION

Tatsuo Waki; Takeshi Watanabe, and Kazuo Suzuki, all of Tsuchiura, Japan, assignors to Lonseal Corporation, Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,686
Claims priority, application Japan, Feb. 21, 1987, 62-38231; Oct. 6, 1987, 62-250614
Int. Cl.[4] C08J 9/06
U.S. Cl. 521—93 36 Claims



1. A hard polyvinyl chloride resin composition comprising, an essential components thereof, the following components (a)–(e):

(a) a polyvinyl chloride base resin produced by suspension polymerization and/or bulk polymerization;

(b) a super high molcular acrylic resin base processing aid of molecualr weight of at least 1,000,000;

(c) a stabilizer containing one or more Group-II and/or Group-IV metals, said stabilizer being free of any Group-I metal;

(d) a surfactant which is a combination of an anionic surfactant and a non-ionic surfactant or a combination of an anionic surfactant and a low polymerization-degree polyolefin or wax; and

(e) a heat-decomposable organic foaming agent.

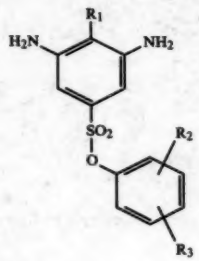
4,797,427

AROMATIC DIAMINES CONTAINING SULFONIC ACID ARYL ESTERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE IN THE PRODUCTION OF POLYURETHANE PLASTICS

Josef Sanders, Cologne; Helmut Reiff, Leverkusen; Gerhard Ballé , Leverkusen, and Dieter Dieterich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,107
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713856
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—159 22 Claims

1. An aromatic diamine containing a sulfonic acid aryl ester corresponding to the formula



wherein

R_1 represents hydrogen, an optionally branched C_1–C_6 alkyl radical, a C_1–C_6 alkoxy radical or a halogen atom,

R_2 and R_3, which may be the same or different, represent hydrogen, an optionally branched C_1–C_{20} alkyl radical, a C_1–C_6 alkoxy radical or a halogen atom.

4,797,428

FOAM SYSTEMS AND ASTM E-84 CLASS 1 RATED FOAMS PRODUCED THEREFROM

Wolfgang W. Reichmann, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 22, 1987, Ser. No. 65,228
Int. Cl.[4] C08G 18/42
U.S. Cl. 521—137 7 Claims

1. A rigid flame retardant foam having an ASTME E-84 Class 1 rating which is the reaction product, formed at an isocyanate index of less than 300, of

(a) an organic polyisocyanate;

(b) an isocyanate-reactive mixture comprising

(i) 25–75 weight % (based on total isocyanate-reactive materials) of an oligoester, wherein said oligoester is the reaction product of a dicarboxylic acid semi-ester or semi-amide and an alkylene oxide, said reaction product being formed in the presence of a catalyst, wherein said catalyst is the N-alkoxylation product of an alkylene oxide of at least three carbon atoms with ammonia, a C_2–C_6 aliphatic diamine, or piperazine, and

(ii) at least 25 weight % of an isocyanate-reactive compound different from oligoester (b)(i); and

(c) a blowing agent.

4,797,429

BROMINE-CONTAINING POLYOLS

David Thorpe, Everberg, Belgium, assignor to Imperial Chemical Industries PLC, London, England

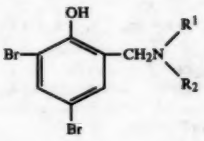
Filed Mar. 11, 1987, Ser. No. 24,569

Claims priority, application United Kingdom, Mar. 12, 1986, 8606066

Int. Cl.[4] C08G 59/00

U.S. Cl. 521—163 10 Claims

1. A Mannich base of the formula:



wherein each of R^1 and R^2, independently, represents a hydroxyalkyl radical.

4,797,430

AMINE-MODIFIED POLYURETHANE (UREA) FOAMS AND A PROCESS FOR THEIR PRODUCTION

Peter Haas, Haan, and Hans-Joachim Kogelnik, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 57,473

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620504

Int. Cl.[4] C08G 18/00, 18/14; C08J 9/00

U.S. Cl. 521—164 19 Claims

1. A process for the production of polyurethane (urea) foams in which

(a) an organic compound having at least two isocyanate-reactive hydrogen atoms and a molecular weight of from 400 to 10,000

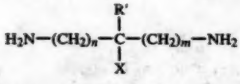
is reacted with

(b) a polyisocyanate

in the presence of

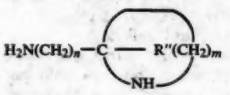
(c) 0.01 to 5.0 parts by weight of a crosslinking agent for every 100 parts by weight isocyanate-reactive compound

(a) wherein said crosslinking agent is a difunctional or polyfunctional amine corresponding to the formula



(I)

or



(II)

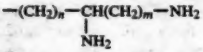
or a mixture of such amines

in which

m and n each represents an integer of from 2 to 10,

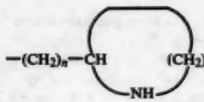
X represents an —OH, —NH_2 or —$(CH_2)_m$ NH_2 group,

R′ represents hydrogen, a C_1–C_5 alkyl group or

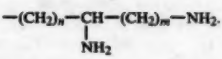


and

R″ represents hydrogen,



or



4,797,431

GLASS/POLY(CARBOXYLIC ACID) CEMENT COMPOSITIONS

Richard W. Billington, London, and Jill A. Williams, Thorpe, both of England, assignors to Dentsply Limited, Weybridge, England

Filed Apr. 6, 1987, Ser. No. 34,880

Claims priority, application United Kingdom, Apr. 18, 1986, 8608546

Int. Cl.[4] A61K 5/06

U.S. Cl. 523—116 8 Claims

1. A substantially optically translucent dental restorative material comprising a polymerized matrix containing an acid or an alkali-leachable source of polyvalent metal ions, said matrix consisting essentially of a homopolymer or copolymer of acrylic acid having a molecular weight of 20,000 to 125,000 and said leachable source consisting essentially of by weight about 15–33% SrF_2, not more than 25% CaO, 28–38% Al_2O_3, 25–30% SiO_2, 0–9% P_2O_5, the ratio of said homopolymer to said leachable source being between 0.15 to 1 and 0.5 to 1 whereby the strontium fluoride provides essentially all of the radiopaque properties.

4,797,432

THERMOPLASTIC EPOXY RESIN AND COATINGS PREPARED THEREFROM

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 24,938, Mar. 11, 1987, abandoned. This application Nov. 19, 1987, Ser. No. 122,979

Int. Cl.[4] C08F 283/10; C08L 63/02; C08K 3/40

U.S. Cl. 523—172 13 Claims

1. A thermally stable, epoxy resin resulting from

(A) reacting a composition comprising

(1) the product resulting from reacting

(a) the product resulting from reacting

(i) at least one aromatic based epoxy resin having an average of more than one but not more than about 2.1 vicinal epoxy groups per molecule and an equivalent weight of not greater than about 225: with

(ii) at least one unsaturated monofunctional carboxylic acid;

wherein components (i) and (ii) are employed in an amount which provides a ratio of equivalents of component (ii) to equivalent of component (i) of from about 0.0087:1 to about 0.035:1: with

(b) at least one unsaturated acrylate ester or methacrylate ester:

wherein component (b) is employed in an amount of from about 5 to about 20 percent by weight of the combined quantity of components (a) and (b):

(2) at least one phenolic compound having an average of more than 1 but not more than about 2 phenolic hydroxyl groups per molecule: and

(3) optionally, at least one aromatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule and an equivalent weight of not greater than about 225: and

wherein components (1) and (3) are employed in quantities which provide a ratio of epoxide groups from component (3) to component (1) of from about zero:1 to about 12:1: and

components (1), (2) and (3) are employed in quantities such that the resultant product has an epoxide equivalent weight (EEW) of from about 700 to about 2000; each of the aforementioned EEWs being calculated on the basis that the aromatic groups contained therein are free of substituent groups even if they do in fact contain substituent groups; and

(B) reacting the product resulting from (A) with

(4) a reactant compound having only one group per molecule which is reactive with a vicinal epoxy group selected from —OH, —SH, —COOH and —CO—O—CO— groups; wherein component (4) is employed in an amount which provides a ratio of groups reactive with a vicinal epoxy group to vicinal epoxy group contained in the product from (A) from about 0.85:1 to about 1.1:1.

4,797,433

UTILIZATION OF MELAMINE WASTE EFFLUENT

Shawqui Lahaiih, Rique, and Ma'mun Absi-Halabi, Salmia, both of Kuwait, assignors to Kuwait Institute for Scientific Research, Safat, Kuwait

Division of Ser. No. 719,158, Apr. 2, 1985, Pat. No. 4,663,387. This application Aug. 25, 1986, Ser. No. 899,889

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] C08L *61/28;* C08G *12/30;* C08J *3/18*

U.S. Cl. 524—3 **4 Claims**

1. A method of improving the workability and stength of concrete mixes which comprises adding to a concrete mixture comprised of portland cement, water, and at least one member selected from the group consisting of sand and aggregate, an effective amount of the thermally stable water soluble resin solution containing melamine, oxy triazines and polycondensates prepared from the mother liquor effluent stream from a melamine manufacturing plant by a process which comprises:

(a) treating the waste solids from the effluent stream with an aldehyde solution at a temperature of about 40° C.–80° C. after adjusting the pH of said solution to about 110°–13.0;

(b) sulfonating the solution from the preceding step at a temperature of aobut 70° C.–90° C. for about 60 to 180 minutes with a sulfonating agent selected from the group consisting of alkali metal sulfites, alkali metal bisulfites and alkali metal metabisulfites;

(c) polymerizing the reactive components contained in the sulfonated solution for the preceding step at a pH of 1.0–5.0 and at a temperature of 30° C.–80° C. for about 10 to about 150 minutes; and

(d) stabilizing the resulting resin solution by heating the same at a pH of about 7.0–10.0 and at a temperature of about 50° C.–100° C. for about 30 to 180 minutes.

4,797,434

PROCESS FOR THE MANUFACTURE OF PARTICULATE BITUMINIZED PLASTICS MATERIAL

Frederick D. Lovatt-Smith, Herstmonceaux, Great Britain, assignor to Denchunt Ltd., Heathfield, Great Britain

PCT No. PCT/GB86/00223, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/06391, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 23, 1986, Ser. No. 2,697

Claims priority, application United Kingdom, Apr. 23, 1985, 8510317

Int. Cl.[4] C08L *23/06, 27/06, 95/00*

U.S. Cl. 524—60 **10 Claims**

1. A process for manufacturing particulate bitumenized plastics material, comprising the steps of providing raw granulated plastics material, adding to said plastics material cationic bitumen emulsion and water to form a mixture, the quantity of added water being substantially greater than the quantity of bitumen emulsion, agitating said mixture to produce particulate plastics material coated with bitumen in which significant agglomeration of the particles is avoided, and separating said particulate material coated with bitumen from said water.

4,797,435

USE OF 3-BENZALPHTHALIDES AS UV STABILIZERS FOR THERMOPLASTIC, AROMATIC POLYESTERS, POLYCARBONATES AND POLYESTER CARBONATES

Thomas Scholl; Volker Serini, both of Krefeld; Dietrich Rathmann, Leverkusen, all of Fed. Rep. of Germany; Ross Savage, Newtownards, Ireland, and Klaus Kircher, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1987, Ser. No. 2,749

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3601900

Int. Cl.[4] C08K *5/34, 5/48, 5/49*

U.S. Cl. 524—89 **6 Claims**

1. Thermoplastic polymers selected from the group consisting of aromatic polyesters, polycarbonates and polyester carbonates stabilized against ultraviolet light with a stabilizing amount of 3-benzalphthalides.

4,797,436

OLIGOMERIC DIAZAOXASPIRODECANES, PREPARATION THEREOF AND USE THEREOF AS LIGHT STABILIZERS FOR POLYMERS

Josef Ertl, Wertingen, and Helmut Korbanka, Adelsried, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

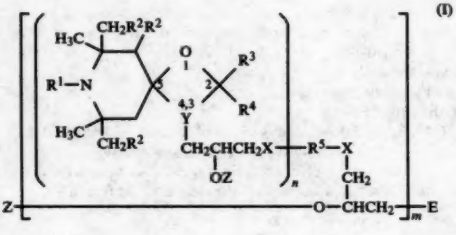
Filed Nov. 24, 1986, Ser. No. 934,109

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541664

Int. Cl.[4] C08K *5/34;* C07D *498/10*

U.S. Cl. 524—97 **12 Claims**

1. A compound of the formula (I)



(I)

in which

n is a whole number from 1 to 4,

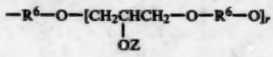
m is a whole number from 1 to 100,

R^1 is hydrogen, C_1- to C_4-alkyl, benzyl, allyl, C_2- to C_{30}-alkanoyl, C_2- to C_{20}-alkenoyl, C_7- to C_{11}-aroyl, C_8- to C_{14}-arylalkanoyl or C_8- to C_{30}-alkylaryl,

R^2 is hydrogen or C_1- to C_4-alkyl,

R^3 and R^4 are identical or different and denote hydrogen, C_1- to C_{13}-alkyl, unsubstituted or chlorine- or C_1- to C_4-alkyl-substituted phenyl, unsubstituted or C_1- to C_4-alkyl-substituted C_7- to C_{14}-aralkyl, or together with the carbon atom connecting them denote an unsubstituted or C_1- to C_4-alkyl-mono-, -di-, -tri- or -tetrasubstituted C_5- to C_{12}-cycloalkyl or piperidine ring,

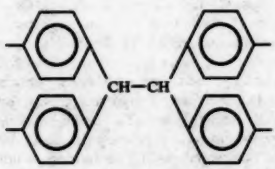
R^5 when n = 1 denotes C_2- to C_{18}-alkylene, unsubstituted or C_1- to C_4-alkyl-mono- or -di substituted phenylene, α,ω-dicarboxyl-C_1- to C_8-alkylene, a dicarboxy-C_6-ring, C_7- to C_{14}-aralkylene, cycloalkylene, dicycloalkylene, tricycloalkylene, bismethylenemonocycloalkylene, bismethylenedicycloalkylene, bismethylenetricycloalkylene, arylene, bisarylenealkyl, which radicals can also be bromine- or chlorine- or C_1–C_4-alkyl-substituted, a radical



with r=1 to 20 and R^6 equal to C_2- to C_{12}-alkylene, cycloalkylene, dicycloalkylene, tricycloalkylene, bismethylenemonocycloalkylene, bismethylenedicycloalkylene, bismethylenetricycloalkylene, arylene, bisarylenealkyl, which radicals can also be bromine- or chlorine- or C_1- to C_4-alkyl-substituted,

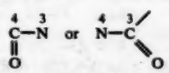
R^5 when n=2 denotes the radical of a trifunctional alcohol or amine, the trifunctional radical of an aliphatic alcohol which contains further hydroxyl groups, or the trifunctional radical of a novolak based on phenyl, cresol, bisphenol-F or bisphenol-A,

R^5 when n=3 denotes the tetrafunctional radical of an aliphatic alcohol or amine or of a novolak based on phenol, cresol, bisphenol-F or bishenol-A or the radical



R^5 when n=4 denotes a pentafunctional radical of a polyol, or a polyamine or of a novolak based on phenol, cresol, bisphenol-F or bisphenol-A,

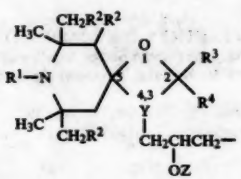
Y denotes



and occupies ring positions 3, 4 in the formula (I),

X represents —O— or

where R^7 is hydrogen, C_1- to C_{30}-alkyl, a piperidine ring which is substituted by 1 to 4 C_1- to C_4-alkyl groups, or a radical of the formula (II)

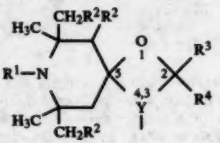


(II)

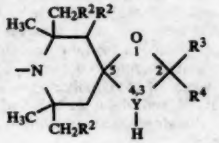
in which R^1, R^2, R^3, R^4, Y have the abovementioned meanings,

Z is hydrogen,

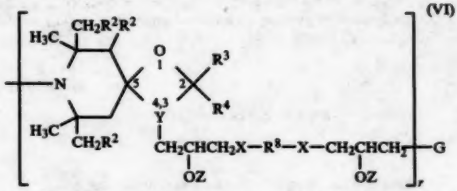
E stands for hydrogen, hydroxyl, a radical of the formula (IV), (V) or (VI)



(IV)

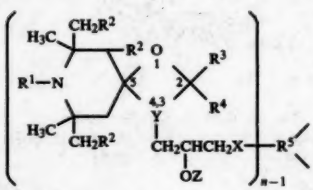


(V)



(VI)

in which R^1, R^2, R^3, R^4, R^5, X, Y and Z have the abovementioned meanings, r represents a whole number from 1 to 100, and G is a radical of the formula (IV) or (V) and R^8 has the meaning of formula (VII)



(VII)

in which R^1, R^2, R^3, R^4, R^5, X, Y, Z and n have the abovementioned meanings.

4,797,437

THERMOPLASTIC ELASTOMER

Michael D. Golder, Allendale, and Stanley J. Gromelski, Jr., West Caldwell, both of N.J., assignors to Hoechst Celanese Corporation, Chatham, N.J.

Filed Dec. 1, 1983, Ser. No. 557,100

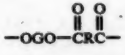
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[4] C08L 67/02

U.S. Cl. 524—100 **10 Claims**

1. Thermoplastic elastomer composition consisting essentially of:

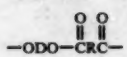
(a) segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented by the formula



Formula I

and said short chain units being represented by the formula

Formula II

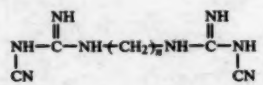


where G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a difunctional polyether glycol having a number average molecular weight in the range from about 400 to about 6,000, R is a hydrocarbon radical remaining after removal of the carboxyl groups from terephthalic acid or isophthalic acid, and D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol or 1,4-butenediol; provided, said short chain units amount to between about 30% and about 85% by weight of the copolyester;

(b) between about 0.1 and about 25% by weight of said polyester of polyvinylpyrrolidone having a K value not exceeding about 30;

(c) between about 0.05 and about 5% by weight of said copolyester of cyanoguanidine or guanidine stabilizer of the formula

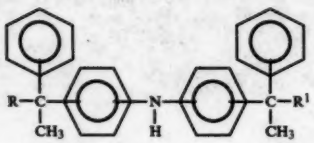
Formula III



where n is an integer between 2 and about 20;

(d) between about 0.1 and about 5% by weight of said copolyester of diphenylamine derivative of the formula

Formula IV



where R and R^1 are methyl or phenyl; and

(e) between 0.05 and about 3% by weight of said copolyester of phosphorus compound of the formula

Formula V

where each of R and R_1 independently represents a hydrocarbon radical selected from the group consisting of alkyl, aryl and alkyl/aryl hydrocarbon radicals having from 1 to about 22 carbon atoms and R_3 represents hydrogen or a hydrocarbon radical selected from the group consisting of alkyl, aryl and alkyl/aryl hydrocarbon radicals having from 1 to about 22 carbon atoms.

4,797,438

STABILIZED GAMMA-IRRADIATED POLYPROPYLENE AND STERILIZABLE ARTICLES THEREOF

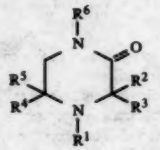
George Kletecka, Fairview Park; John T. Lai, Broadview Heights, and Pyong-Nae Son, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 11, 1987, Ser. No. 48,168

Int. Cl.[4] C08K 5/34

U.S. Cl. 524—100 9 Claims

1. A method for imparting improved strength and discoloration resistance to a stabilized, gamma-irradiated polypropylene polymer article which comprises incorporating into said polypropylene polymer, which is essentially free of an antioxidant, an effective amount from 20 ppm to 2% of a hindered amine stabilizer containing a polysubstituted piperazin-2-one (PSP) moiety having the structure



wherein,

R^1 represents hydrogen, oxygen, C_1–C_{18} alkyl, C_1–C_6 hydroxyalkyl, C_2–C_{12} acyl, C_3–C_8 alkenyl, C_3–C_8 alkynyl, C_7–C_{12} aralkyl which is unsubstituted or substituted in the alkyl moiety by hydroxyl, or C_1–C_8 alkanoyl or C_3–C_5 alkenoyl;

R^2, R^3, R^4 and R^5 independently represent hydrogen, C_1–C_{24} alkyl, C_1–C_{12} hydroxyalkyl, C_1–C_{12} haloalkyl, C_1cyanoalkyl, C_2–C_{12} aminoalkyl or iminoalkyl, C_3–C_{18} ether groups, C_4–C_{18} hydroxyalkyl ether or cyanoalkyl ether groups, C_7–C_{14} alkenyl or aralkyl, C_2–C_7 alkylene, and optionally containing a phosphite, ester, or hindered phenol group, and which in combination, one with another, represent C_5–C_{14} cycloalkyl at least four of which C atoms are cyclized, and, optionally containing a keto, ester, amide, ether, thio or hydroxy groups; but, only one of R^2 and R^3, and only one of R^4 and R^5 may be hydrogen; and, R^6 represents a free valency through which the PSP moiety is connected to the remaining structure of the stabilizer;

said hindered amine stabilizer being selected from the group consisting of (i) a bis-compound consisting of a C_2–C_{12} alkylene connecting two PSP moieties, and (ii) a polyalkylene polyamine having a pendant triazine ring with a PSP substituent;

said effective amount being sufficient to attenuate oxidative degradation of said polypropylene polymer.

4,797,439

DIORGANOPOLYSILOXANES CURABLE INTO ADHESIVE/ELASTOMERIC STATE

Pierre-Michel Peccoux, Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 11, 1987, Ser. No. 95,408

Claims priority, application France, Sep. 11, 1986, 86 12892

Int. Cl.[4] C08K 5/54

U.S. Cl. 524—188 10 Claims

1. A storage-stable diorganopolysiloxane composition of matter curable into elastomeric state, comprising an α,ω-dihydroxydiorganopolysiloxane polymer, a ketiminoxysilane cross-linking agnet therefor, and a tackifier which comprises a (Δ^2-imidazolinyl)alkylsilane in an amount effective to enhance adhesion of the composition.

4,797,440

DISPERSED PARTICULATE COMPOSITION

John D. Schofield, Bury, and Roger Slater, Saddleworth, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 25, 1987, Ser. No. 66,236

Claims priority, application United Kingdom, Jul. 16, 1986, 8617186

Int. Cl.[4] C08K 5/16, 5/10, 5/09

U.S. Cl. 524—239 7 Claims

1. A composition comprising a dispersion of a finely divided particulate solid in a thermoplastic polymeric organic medium in the presence of a lubricant and a processing additive of the formula:

wherein

A is a divalent aliphatic radical containing 17 carbon atoms, at least 4 of which are directly between the oxygen atom and the carbonyl group;

J is H, a metal, NH_4 or substituted ammonium;

T is selected from alkyl, alkenyl, cycloalkyl, polycycloalkyl, aryl, and polyaryl, each of which is unsubstituted or substituted by a group selected from hydroxy, halo and C_{1-4}-alkoxy; and

n is an integer between 1 and 6.

4,797,441

DICHLORO (ACETIC OR PROPIONIC) ACID ARYL ESTER FLAME RETARDANTS

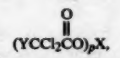
William J. Parr, Naperville, Ill., and Peter Hope, Twello, Netherlands, assignors to Akzo N.V., Netherlands

Filed Jun. 11, 1987, Ser. No. 61,932

Int. Cl.[4] C07C *69/63, 147/115, 149/40;* C08K *5/10*

U.S. Cl. 524—288 **9 Claims**

1. A compound of the formula



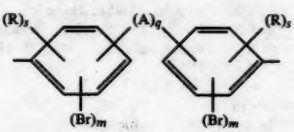
$$(YCCl_2CO)_pX,$$

where Y has the meaning of a methyl group or hydrogen atom and p=1 or 2, and when p=1,

X =

wherein n=2,3,4 or 5 and n +r+5 and when p=2,

X =



wherein separately for each aromatic ring m=2,3 or 4 and m+s≦4 and q=O or 1, where R is a lower alkyl group containing 1 to 3 carbon atoms, and when q=1, A is a substituted or unsubstituted alkylidene group containing 1 to 3 carbon atoms, SO_2, S or O.

4,797,442

MELT PROCESSABLE CPVC BLENDS AND ALLOYS THEREOF

Richard C. Neuman, Vermilion, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 895,096, Aug. 11, 1986, Pat. No. 4,710,533. This application Oct. 19, 1987, Ser. No. 109,683

Int. Cl.[4] C08K *5/09, 27/04*

U.S. Cl. 524—394 **11 Claims**

1. A melt processed chlorinated polyvinyl chloride polymer alloy, comprising:

100 parts by weight of chlorinated polyvinyl chloride, said chlorinated polyvinyl chloride having a chlorine content of at least 60% by weight,

from about 12 parts to about 40 parts by weight of a flow enhancing polymer for every 100 parts by weight of said chlorinated polyvinyl chloride, and

from about 2 parts to about 10 parts by weight for every 100 parts by weight of said chlorinated polyvinyl chloride of a compatibilizing agent,

said chlorinated polyvinyl chloride, said flow enhancing polymer, and said compatibilizing agent melt processed at a temperature of from about 300° F. to about 400° F.

4,797,443

STABILIZED VINYL HALIDE RESINS AND COMPOSITIONS AND ARTICLES MADE THEREFROM

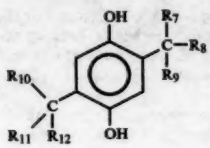
Zaev Sharaby, Cleveland Heights, and Josef C. Vyvoda, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 29, 1985, Ser. No. 728,548

Int. Cl.[4] C08K *5/13*

U.S. Cl. 524—347 **13 Claims**

1. A stabilized vinyl halide resin composition comprising a vinyl halide resin and at least one 2,5-substituted hydroquinone stabilizer having the formula



wherein R_7, R_8, R_{10}, and R_{11} are methyl and R_9 and R_{12} are either methyl or ethyl.

4,797,444

WATERBORNE PIGMENTED ACRYLIC HYDROSOL COATING COMPOSITION AND PROCESS

Richard A. Cowles, Perrysburg, Ohio; Nick Georgalas, Chappaqua, N.Y., and Shailesh C. Shah, Paramus, N.J., assignors to BASF Corporation, Clifton, N.J.

Filed Feb. 3, 1987, Ser. No. 10,452

Int. Cl.[4] C08J *3/02;* C08K *3/20*

U.S. Cl. 524—501 **7 Claims**

1. A waterborne pigmented coating composition comprising one or a combination or mixture of substantially uniformly dispersed pigment particles, a film forming constituent comprising a mixture of uniformly dispersed acrylic hydrosol particles and an aqueous soluble salt of a thermosettable dispersant polymer having acid functionality, the aqueous soluble salt having a volatile substituent, and a liquid constituent comprising a mixture of water and organic solvents, the organic solvents functioning as coalescing agents for the film forming constituents whereby the resulting composition is substantially free of surfactants and emulsifiers.

4,797,445

NON-TRANSFERRING DRY-FILM MOLD RELEASE AGENT

Charles Piskoti, Grand Blanc, Mich., assignor to Genesee Polymers Corporation, Flint, Mich.

Continuation of Ser. No. 925,466, Oct. 30, 1986, abandoned, which is a continuation of Ser. No. 715,507, Mar. 26, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 180,628

Int. Cl.[4] C08L *83/00*

U.S. Cl. 524—588 **15 Claims**

1. A method of preparing an organoalkoxy substituted silicone resin consisting essentially of the steps of: adding an organo-silicone resin that is a three dimensional trifunctional siloxane polymer with each silicone atom sharing three oxygen atoms with adjacent silicon atoms and having hydroxyl-terminated functional groups, to an alkoxysilane wherein the ratio of resin contributed moles of hydroxyl groups to alkoxysilane containing molecules is at least 1:1 in the presence of catalytic amounts of a titanate compound and incubating the mixture until there is complete substitution of the hydroxyl groups with alkoxy moieties from the alkoxysilane to derive the stable organoalkoxy substituted silicone product absent any free

hydroxyl groups having extended shelf life and a hydroxylated biproduct.

4,797,446

ADHESION OF SILICONE SEALANT

John E. Dietlein, Bay City, and Jerome M. Klosowski, Monitor Township, Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 508, Jan. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 787,587, Oct. 15, 1985, abandoned. This application Jan. 28, 1988, Ser. No. 149,252

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—860 17 Claims

1. A composition consisting essentially of a product obtained by mixing

(A) 100 parts by weight of a hydroxyl or alkoxy endblocked polydiorganosiloxane having viscosity of between 1.0 and 100 Pa.s at 25° C. the organic groups being selected from the group consisting of methyl, ethyl, propyl, phenyl, and trifluoropropyl.

(B) from 0.35 to 9.0 parts by weight of an alkyltrialkoxysilane of the formula $RSi(OR')_3$ where R is a monovalent hydrocarbon radical of from 1 to 4 carbon atoms and R is an alkyl or alkoxyalkyl radical.

(C) from 0.5 to 5.0 parts by weight of titanium catalyst such that there is from 0.05 to 0.94 part of titanium.

(D) from 0 to 250 parts by weight of filler,

(E) silane of the formula

$$(MeO)_3SiCH_2CH_2CH_2NHCH_2CH_2NH_2$$

in an amount such that there is from 0.1 to 1.0 mole of silane per mole of titanium in (C), and

(F) silane of the formula

$$(MeO)_3SiCH_2CH_2CH_2OCH_2CH\text{—}CH_2$$

(with O)

an amount such that there is at least 25 percent on a molar basis of the amount of (E) present, and less than about 5 percent by weight based upon the weight of (A).

4,797,447

IMPACT RESISTANT BLENDS OF THERMOPLASTIC POLYESTERS AND MODIFIED BLOCK COPOLYMERS

William P. Gergen, Houston, and Robert G. Lutz, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1985, Ser. No. 766,216

Int. Cl.[4] C08L *67/02, 53/02*

U.S. Cl. 525—92 34 Claims

1. Impact resistant polymeric composition comprising:

(a) from 50 to 97 percent by weight of a thermoplastic polyester; and

(b) from 3 to 50 percent by weight of a functionalized selectively hydrogenated block copolymer of the formula $B_n(AB)_oA_p$ where n=0 or 1, o≧1, p=0 or 1, each A is predominantly a polymerized vinyl aromatic hydrocarbon block and, each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which has been grafted at least one graftable functional molecule selected from the group consisting of an electrophilic graftable molecule containing a functional group and an electrophile, wherein substantially all of said electrophilic graftable molecules or electrophiles are grafted to the block copolymer in the vinyl aromatic hydrocarbon block.

4,797,448

ADDITIVE FOR ARYLENE SULFIDE POLYMERS OF IMPROVED IMPACT STRENGTH

Yeon F. Liang, Florence, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 875,815, Jun. 18, 1986, Pat. No. 4,708,983, and a continuation-in-part of Ser. No. 744,078, Jun. 12, 1985, abandoned. This application Jun. 2, 1987, Ser. No. 57,406

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—106 18 Claims

1. A composition comprising

(A) at least one polysiloxane having the repeating unit

(B) at least one trialkoxysilane having the formula $X—Si(OR')_3$, and

(C) at least one solid, resinous polyolefin selected from the group consisting of homopolymers and copolymers of mono-1-olefins having from 2 to 6 carbon atoms per molecule;

wherein each R is a monovalent hydrocarbyl radical having from 1 to 8 carbon atoms, individually selected from the group consisting of alkyl, cycloalkyl, alkylcycloalkyl, aryl and alkaryl; each R' is a radical having from 1 to 8 carbon atoms, individually selected from the group consisting of alkyl and alkoxyalkyl radicals; and X is a radical having from 1 to 8 carbon atoms, selected from the group consiting of mercaptoalkyl and aminoalkyl groups.

4,797,449

RESIN COMPOSITIONS

Takeo Nakayama, Ibaraki; Saburo Inoue, Toyonaka, and Takurou Sakamoto, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

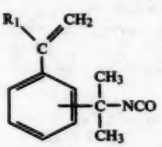
Filed Mar. 3, 1988, Ser. No. 163,850

Claims priority, application Japan, Mar. 5, 1987, 62-51048; Oct. 2, 1987, 62-250467

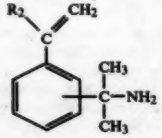
Int. Cl.[4] C08L *75/04*

U.S. Cl. 525—217 8 Claims

1. A resin composition, which comprises (a) a copolymer containing isocyanate group prepared by subjecting a compound represented by the general formula:



wherein R_1 stands for hydrogen or methyl group and an ethylenic unsaturated monomer to copolymerization, and (b) a copolymer containing amino group prepared by subjecting a compound represented by the general formula:



wherein R_2 stands for hydrogen or methyl group and an ethylenic unsaturated monomer to copolymerization.

4,797,450

ADDITIVES FOR WATER-BASE DRILLING FLUID AND PROCESS

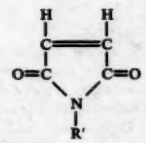
David C. Dehm, Thornton, and H. Franklin Lawson, Downingtown, both of Pa., assignors to Arco Chemical Company, Newtown Square, Pa.

Continuation of Ser. No. 547,304, Oct. 31, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 854,959

Int. Cl.[4] C08F 8/36

U.S. Cl. 525—326.7 2 Claims

1. A dispersant for water-based drilling fluids comprising a sulfonated copolymer containing from about 25 to about 75 mole percent recurring units of a maleimide monomer and from about 75 to about 25 mole percent recurring units of a vinyl monomer, wherein the maleimide monomer has the formula:



wherein R′ represents an aromatic group wherein the vinyl monomer has the formula:

wherein R^2 represents an aromatic group, or an alkyl substituted aromatic group, wherein the copolymer has a number average molecular weight within the range of from about 1,000 to about 50,000, and wherein both the maleimide and the vinyl monomers of the copolymer are sulfonated subsequent to the polymerization reaction between the maleimide monomer and the vinyl monomer by reacting the resulting copolymer with a sulfonating agent.

4,797,451

SOLID POLYMERIC STABILIZER COMPOUNDS AND PROCESS FOR THEIR MANUFACTURE

Arnaldo Roggero, San Donato Milanese; Guglielmo Bertolini, Pavia, and Carlo Busetto, Milan, all of Italy, assignors to Enitricerche S.p.A., Milan, Italy

Filed Sep. 24, 1986, Ser. No. 910,885

Claims priority, application Italy, Oct. 9, 1985, 22408 A/85

Int. Cl.[4] C08F 8/42, 65/00

U.S. Cl. 525—332.9 13 Claims

1. A process for the preparation of a polymeric stabilizer compound comprising:

(a) dissolving a vinyl-aromatic polymer, aromatic ether polymer, dienic or olefinic polymer containing hydrogen atoms replaceable by metal atoms in an inert organic solvent;

(b) replacing at least partially by metal atoms the replaceable-by-metal hydrogen atoms of said vinyl-aromatic polymer, aromatic ether polymer, dienic or olefinic polymer by reacting a metal-atoms-introducing agent selected from C_1–C_{12} metal-alkyls, alkali metal hydrides or alkali metal amides with said vinyl-aromatic polymer, aromatic ether polymer, dienic or olefinic polymer;

(c) reacting said vinyl-aromatic polymer, aromatic ether polymer, dienic or olefinic polymer, into which metal atoms have been so introduced, with a compound having a sterically hindered aminic function and an electrophilic function, said reaction being carried out using stoichiometric or nearly stoichiometric ratios between said compound having a sterically hindered aminic function and the carbanionic centers of said polymer into which metal atoms have been introduced, at a temperature of 0° to 150° C., for a period of 30 minutes to 6 hours, to form said polymeric stabilizer compound;

(d) separating polymeric stabilizer compound from the reaction mixture of the preceding step, in the form of a subdivided solid.

4,797,452

POLYMERIC HYDROGENATION CATALYST CONTAINING PENDANT RHODIUM CONTAINING GROUPS

Lawson G. Wideman, Tallmadge, and Wen-Liang Hsu, Copley, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 19, 1987, Ser. No. 16,605

Int. Cl.[4] C08F 8/04; C08C 19/02

U.S. Cl. 525—338 15 Claims

1. A process for improving the selectivity of hydrogenating double bonds in the backbone of a polymer containing double bonds in its backbone and vinyl unsaturation, said process comprising contacting said polymer containing double bonds in its backbone and vinyl unsaturation with hydrogen in the presence of a polymer containing pendant groups having the structural formula $-Rh(P\phi_3)_2X$ wherein ϕ represents a phenyl group; wherein X represents a halogen atom; wherein said process is carried out at a pressure within the range of 1.0×10^5 Pascals to about 7.0×10^6 Pascals; and wherein said process is carried out at a temperature which is within the range of about 20° C. to about 200° C.

4,797,453

GRAFT POLYMERS OF POLYPHENYLENE ETHERS

Christof Taubitz, Wachenheim; Hermann Gausepohl, Mutterstadt; Erhard Seiler, Ludwigshafen, and Lothar Schlemmer, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 63,687

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621207

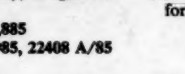
Int. Cl.[4] C08L 71/02

U.S. Cl. 525—397 4 Claims

1. A graft polymer of

(A) a polyphenylene ether as a base polymer and

(B) a half ester of an unsaturated dicarboxylic acid of the formula



I

as a graft monomer, where R^1 is C_1–C_{25}-alkyl, C_2–C_{25}-alkylene or aryl, R^2 and R^3 are each hydrogen, bromine, chlorine or one of the radicals R^1, and Q is hydrogen, an alkali metal, one equivalent of an alkaline earth metal or an ammonium cation.

4,797,454

CURABLE RESIN SYSTEMS CONTAINING CYANATE ESTER FUNCTIONAL OXAZOLINYLPOLYSILOXANES

Hong-Son Ryang, Camarillo, Calif., assignor to BASF Corporation, Parsippany, N.J.

Filed Sep. 24, 1987, Ser. No. 100,652

Int. Cl.[4] C08F 283/00

U.S. Cl. 525—476 13 Claims

1. A cyanate-functional oxazolinylpolysiloxane modifier for heat curable resins which comprises the reaction product of an epoxy-functional polysiloxane and a polycyanate-functional monomer.

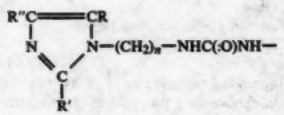
4,797,455

ISOCYANATES BLOCKED WITH 1-AMINO-ALKYLIMIDAZOLES AS EPOXY CURING AGENTS

Shiow-Ching Lin, Ellicott City, and Ping-Lin Kuo, Columbia, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 6, 1987, Ser. No. 82,168
Int. Cl.[4] C08G 59/40
U.S. Cl. 525—504 16 Claims

1. A single package epoxy resin composition comprising a curable epoxy resin and composition of the formula X_mY where X is



wherein

m has a value of at least 1;

R and R" are independently H,, methyl, or ethyl; n is 2–5;

R' is methyl or ethyl; and

Y has a valence m and is an organic radical.

4,797,456

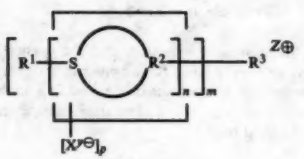
AQUEOUS-DISPERSIBLE CYCLIC SULFONIUM COMPOUNDS THAT CURE TO FORM WATER-INSOLUBLE POLYMERS

Ritchie A. Wessling; Donald L. Schmidt, both of Midland, Mich., and Kiyoshi I. Aikawa, Chiba Prefecture, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1982, Ser. No. 448,083
Int. Cl.[4] C08G 59/14; C08F 128/06; C07D 333/02
U.S. Cl. 525—531 3 Claims

1. A water-soluble cyclic aliphatic sulfonium salt represented by the formulas:

or



wherein R^1 is a n-valent organic radical wherein each valence bond to the sulfonium moiety is on an aliphatic carbon other than benzyl; R^2 is a polyvalent organic radical that unites with the sulfonium atom to form a 5- to 7-membered ring, said R^2 bearing a molecular weight enhancing substituent (R^3); R^3 is an α,β-alkenyl carbonyloxy moiety and X is a hydroxide, saturated carboxylate, polycarboxylate, bicarbonate, sulfate or alkylaryl sulfonate; n is an integer from 1 to 500, m is an integer from 1 to 500 provided that the produce of $m \times n \geq 500$, y is a number from 1 to 4, z is a number corresponding to the net cationic charge on the sulfonium cation and p is a number equal to z/y.

4,797,457

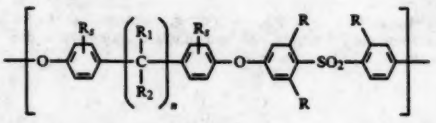
PREPARATION OF SUBSTITUTED POLYSULFONES THROUGH ORTHO-METALATED INTERMEDIATES

Michael D. Guiver; John W. ApSimon, and Oleh Kutowy, all of Ottawa, Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Oct. 27, 1986, Ser. No. 923,211
Claims priority, application Canada, Oct. 29, 1985, 494160
Int. Cl.[4] C08G 65/40
U.S. Cl. 525—534 33 Claims

1. An aromatic polysulfone derivative containing repeating units of the formula:

(I)



wherein each R is ortho to the sulfone, at least one R per polymer chain is an aliphatic or aromatic substituent, a heteroatom, heteroatom-containing group, metal or metal-containing group, with any remainder thereof being hydrogen; R_1 and R_2 each represent lower alkyl or aryl; each R_s is hydrogen and n is zero or one.

4,797,458

COLLOIDAL STABLE VINYL HALIDE POLYMERIZATIONS WITH MERCAPTAN CHAIN TRANSFER AGENTS

Zaev Sharaby, University Heights, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Sep. 2, 1986, Ser. No. 902,714
Int. Cl.[4] C08F 2/20, 2/38
U.S. Cl. 526—194 14 Claims

1. A process for the production of vinyl halide polymers by aqueous polymerization, comprising the use of a chain transfer composition wherein said chain transfer composition comprises (a) at least one mercaptan chain transfer agent, and (b) at least one material which is characterized by being (i) miscible with said mercaptan, (ii) substantially insoluble in water, and (iii) is non-polymerizable with said vinyl halide; and wherein all of the chain transfer composition is added to the polymerization medium prior to the start of the polymerization reaction.

4,797,459

DISPERSING AGENTS FOR PRODUCING VINYL POLYMER POLYOLS UTILIZING AN ALKOXYLATED ALKYL OR ALKYLPHENYL POLYOXYALKYLENE ISOPROPYLAMINE

Michael Cuscurida, Austin, Tex., assignor to ARCO Chemical Company, Newtown Square, Pa.

Continuation-in-part of Ser. No. 780,155, Sep. 26, 1985, Pat. No. 4,683,277. This application Mar. 30, 1987, Ser. No. 31,498
Int. Cl.[4] C08F 2/30
U.S. Cl. 526—209 15 Claims

1. A vinyl polymer polyol prepared by polymerizing via a free radical initiated reaction a monomer component of at least one vinyl monomer in the presence of a dispersing medium comprising a polyether polyl which does not contain nitrogen in a dispersing agent comprising the reaction product of a compound selected from the group consisting of an alkyl polyoxyalkylene isopropyl amine and an alkylphenyl polyoxyalkylene isopropyl amine, with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof.

4,797,460

TACKIFIER RESIN COMPOSITION AND PROCESS FOR PREPARING SAME

Curry B. Davis, Panama City, Fla., assignor to Arizona Chemical Company, Panama City, Fla.

Filed Jan. 12, 1987, Ser. No. 2,040
Int. Cl.[4] C08F 212/00, 212/08
U.S. Cl. 526—281 9 Claims

1. A tackifier resin composition prepared by the copolymerization of A110-ocimene containing isomerizates selected from the class consisting of the reaction product of pyrolysis isomerized turpentine, the reaction product of pyrolysis isomerized alpha-pinene and mixtures thereof and a vinyl benzene derivative selected from a class consisting of styrene, alpha-methyl styrene, para-methyl styrene, vinyl toluene and mixtures thereof.

4,797,461

AMORPHOUS HIGH MOLECULAR WEIGHT COPOLYMERS OF ETHYLENE AND ALPHA-OLEFINS

Marie-Line Aubanel, Saint Mitre-les-Ramparts, and Jean C. Bailly, Martigues, both of France, assignors to BP Chemicals Limited, London, England

Filed Apr. 14, 1987, Ser. No. 38,211
Claims priority, application France, Apr. 17, 1986, 8605541
Int. Cl.[4] C08F 210/16
U.S. Cl. 526—348.6 4 Claims

1. Amorphous copolymers of ethylene and of one or more alpha-olefins comprising 3 to 12 carbon atoms, which copolymers are characterised in that they have a content of units derived from ethylene comprised between 40 and 60% molar, a content of units derived from propylene and/or 1-butene comprised between 60 and 40% molar and a content of units derived from alpha-olefins comprising 5 to 12 carbon atoms comprised between 0 and 10% molar, an intrinsic viscosity measured at 135° C. in decalin greater than 10 dl/g, a crystallinity level of the polyethylene type measured by X-ray diffraction of less than or equal to 1.0%, no measurable crystallinity of the polypropylene or polybutene type, a fusion enthalpy, measured by differential scanning calorimetry of less than or equal to 3 J/g, and substantially no inversion in the chain formation of units derived from alpha-olefins containing 3 to 12 carbon atoms, these copolymers occurring in the form of a powder consisting of solid, non-sticky particles.

4,797,462

ORGANOPOLYSILOXANES CONTAINING CURE ACCELERATORS

Michel Letoffe, Sainte Fay Les Lyon, and Georges Barrandon, Mornant, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 11, 1987, Ser. No. 95,407
Claims priority, application France, Sep. 11, 1986, 86 12893
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—12 11 Claims

1. An organopolysiloxane composition of matter curable into elastomeric state, comprising a polyhydroxylated polysiloxane, a polyacyloxysilane crosslinking agent, and an effective amount of a cure accelerator comprising at least one of calcium oxide, strontium oxide or barium oxide.

4,797,463

TWO-COMPONENT MATERIAL AND THE USE THEREOF

Stefan Grimm, Eppelheim; Michael Schatzle, Walldorf, and Fritz Stahr, Penzberg, all of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,442
Int. Cl.[4] C08G 18/10
U.S. Cl. 528—60 6 Claims

1. Two-component material based on curable prepolymers and conventional additives, characterized in that the volume ratio of the first to the second component is 0.5:1 to 1.5:1, both components contain curable prepolymer, the prepolymer in the first component is a polyurethane prepolymer with free NCO-groups, the prepolymer in the second component is a polymer with free SH-groups and the first component contains curing agent for the polymer with free SH-groups and the second component curing agent for the polyurethane prepolymer with the free NCO-groups.

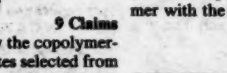
4,797,464

DIEPOXIDE REACTED WITH A HALF ESTER FROM A DICARBOXYIC ACID ANHYDRIDE AND POLYALKYLENE GLYCOL

Neil H. Nodelman, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Aug. 7, 1987, Ser. No. 83,537
Int. Cl.[4] C08G 63/42, 59/42
U.S. Cl. 528—110 5 Claims

1. A polyester polyol having the idealized structure:



where R represents the residue of a polyepoxide after ring opening with a carboxylic acid group, R' represents the residue of a cyclic anhydride, n is a number of from 4 to 25, m represents the number of epoxy groups of the polyepoxide ring opened with carboxylic acid groups, and R" represents —H or $—CH_3$.

4,797,465

WHOLLY AROMATIC MESOMORPHIC POLYETHER ESTERS AND THE PREPARATION THEREOF

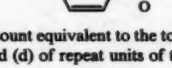
Michael Portugall, Wachenheim; Gerd Blinne, Bobenheim, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,050
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542778
Int. Cl.[4] C08G 63/60
U.S. Cl. 528—176 7 Claims

1. A wholly aromatic mesomorphic polyester which forms a liquid-crystalline fiber-forming melt below 320° C. and is composed of

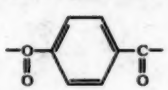
(a) not less than 10 mol % of repeat units of the formula I

I



(b) a molar amount equivalent to the total amount of components (c) and (d) of repeat units of the formula II

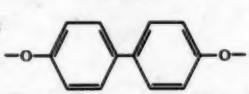
II



(c) from 3 to 20 mol % of repeat units of the formulae III and/or IV

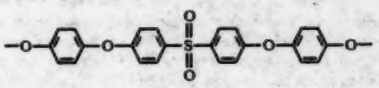
III

IV



and

(d) from 5 to 30 mol % of repeat units of the formula V



V

the molar proportions of components a, b, c and d adding up to 100 mol % in each case.

4,797,466

HIGH-TEMPERATURE ADHESIVE POLYIMIDE FROM 2,6-BIS(3-AMINOPHENOXY)PYRIDINE

Hideaki Oikawa; Masahiro Ohta, both of Yokohama; Saburo Kawashima, Yokosuka; Shoji Tamai; Yoshiho Sonobe, both of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

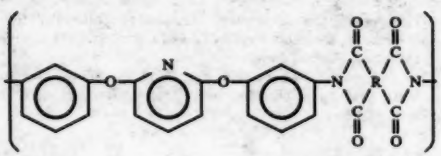
Filed Feb. 6, 1987, Ser. No. 11,907

Claims priority, application Japan, Feb. 12, 1986, 61-026936

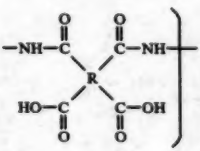
Int. Cl.[4] C08G *73/10*

U.S. Cl. 528—185 6 Claims

1. Polyimide consisting of recurring units of the formula:



wherein R is a tetra-valent radical selected from the group consisting of an aliphatic radical having not less than two carbons, a cyclo-aliphatic radical, a monoaromatic radical, a condensed polyaromatic radical and a non-condensed polyaromatic radical wherein the aromatic radicals are linked to one another directly or via bridged member, wherein the polyamic acid precursor of said polyimide consists of recurring units of the formula:



and has an inherent viscosity of 0.1 to 3 0 dl/g measured to 35° C. in a solution of 0.5 gram of said polyamic acid per 100 ml of n,n-dimethylacetamide solvent.

4,797,467

THERMOPLASTIC POLYCARBONATE BRANCHED WITH TETRA-HYDROXYARYL-BIS-QUINOXALINE

Volker Eckhardt; Hans-Rudolf Dicke, and Dieter Freitag, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

This application Division of Ser. No. 876160, Jun. 19, 1986, Pat. No. 4,739,058. Aug. 13, 1987, Ser. No. 84,776

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524054

Int. Cl.[4] G08G *63/62*

U.S. Cl. 528—203 2 Claims

1. In the process for the preparation of brancehed thermoplastic polycarbonate from at least one diphenol, a branching agent and either phosgene or a carbonic acid diaryl ester the improvement comprising employingas a branching agent a bisquinoxaline conforming to the formula

wherein R independently denotes a 4-hydroxy aryl or a 3-hydroxyaryl radical which is unsubstituted or substituted with one or more alkyl, alkoxy, aryl or a halogen substituent and Ar denotes a tetravalent mononuclear or a polynuclear aromatic radical which is unsubstituted or substituted with one or more alkyl, alkoxy, aryl or a halogen substitutent, said polynuclear radical being selected from the group consisting of fused rings and bridges rings and said bridged rings being bridged by a member selected from the group consisting of hetero atoms and carbonyl groups.

4,797,468

PREPARATION OF POLYLACTIC ACID AND COPOLYMERS OF LACTIC ACIDS

Klaas S. De Vries, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

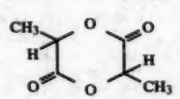
Filed Dec. 10, 1987, Ser. No. 130,905

Claims priority, application Netherlands, Dec. 19, 1986, 8603231

Int. Cl.[4] C08G *63/08;* C07D *319/12*

U.S. Cl. 528—354 10 Claims

1. Method for preparing polylactic acid or copolymers of lactic acid by polymerizing the lactide according to formula I:



(I)

comprising forming the lactide according to formula I by polycondensation of L-, D- or D, L-lactic acid followed by decomposition of the low-molecular polylactic acid thus obtained to yield crude lactide I, dissolving the crude lactide I in a liquid organic solvent that is not miscible with water, extracting the solution thus formed with a water solution comprising a basic substance that is sparingly soluble or insoluble in the organic solvent, isolating the lactide I from the organic solvent layer and polymerizing the isolated lactide I to the high-molecular polylactic acid or copolymer thereof.

4,797,469

SYNTHESIS OF HGRF (SOMATOCRININ) IN LIQUID PHASE AND INTERMEDIATE PEPTIDES

Joseph Diaz, Perols; Henri Demarne, Montpellier; Roméo Roncucci, and Paul-Henry Schmelck, both of Paris, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 752,799, Jul. 8, 1985, Pat. No. 4,707,541. This application Aug. 21, 1987, Ser. No. 87,892

Claims priority, application France, Jul. 10, 1984, 84 10965

Int. Cl.[4] C07K *7/10, 7/06, 7/08, 5/10*

U.S. Cl. 530—324 **7 Claims**

1. An intermediate peptide selected from the following peptides:

H-Ala-Arg-Ala-Arg-Leu-NH_2 called Fragment A hGRF (40-44) or alaninamide;

H-Gln-Glu-Arg-Gly-OH called Fragment B'_1 hGRF (36-39);

H-Glu-Ser-Asn-OH called Fragment B'_2 hGRF (33-35);

H-Ser-Arg-Gln-Gln-Gly-OH called Fragment C hGRF (28-32);

H-Leu-Gln-Asp-Ile-Met-OH called Fragment D' hGRF (23-27);

H-Arg-Lys-Leu-OH called Fragment E'_1 hGRF (20-22);

H-Gln-Leu-Ser-Ala called Fragment F_1 hGRF (16-19);

H-Tyr-Arg-Lys-Val-Leu-Gly-OH called Fragment G_1 hGRF (10-15)

H-Ile-Phe-Thr-Asn-Ser-OH called Fragment H_1 hGRF (5-9); and

H-Tyr-Ala-Asp-Ala-OH called Fragment I hGRF (1-4).

4,797,470

N-TERMINALLY SUBSTITUTED TYROSYL ALANINE

Barnett S. Pitzele, Skokie; Donald W. Hansen, Jr., Chicago; Robert W. Hamilton, Wilmette; Daniel R. Pilipauskas, Glenview, and Michael Clare, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

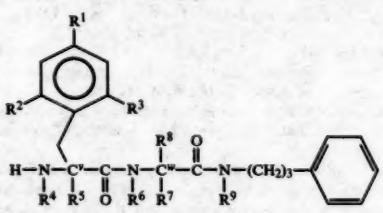
Continuation-in-part of Ser. No. 882,795, Jul. 14, 1986, Pat. No. 4,760,180, which is a continuation-in-part of Ser. No. 829,241, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 765,881, Aug. 14, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 14,340

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

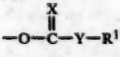
Int. Cl.[4] C07K *5/08*

U.S. Cl. 530—331 **15 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is



wherein X is oxygen or sulfur, Y is oxygen or nitrogen, and R_{11} represents straight or branched chain lower alkenyl having 1–6 carbon atoms, or phenyl or benzyl; wherein R^2 and R^3 may be the same or different and represents straight or branched chain lower alkyl having 1–6 carbon atoms; wherein R^4–R^9 may be the same or different and represent hydrogen, or straight or branched chain lower alkyl having 1–6 carbon atoms; wherein C^{α} is an asymmetric carbon atom when R^7 and R^8 are not the same and may be racemic or may have the D or L configuration; and wherein C^{γ} is an asymmetric carbon atom and may be racemic or having the D or L configuration.

4,797,471

PEPTIDE DERIVATIVES HAVING AN INHIBITORY ACTION ON HYDROXYLATING ENZYMES, A PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THEM, AND THEIR USE

Volker Teetz, Hofheim am Taunus; Stephan Henke, Bad Soden am Taunus; Dietrich Brocks, Wiesbaden; Hartmut Hanauske-Abel, Dexheim, and Volkmar Günzler, Marburg-Cappel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

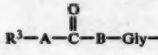
Filed Dec. 12, 1986, Ser. No. 941,066

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544338

Int. Cl.[4] H61K *37/43*; C07K *5/08*

U.S. Cl. 514—18 **11 Claims**

1. A compound of the formula I

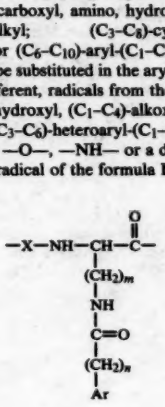


(I)

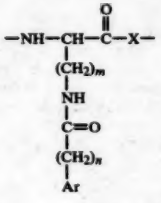
in which R^3 denotes (C_1–C_8)-alkyl which is optionally monosubstituted by carboxyl, amino, hydroxyl or (C_1–C_4)-alkoxy; (C_3–C_8)-cycloalkyl; (C_3–C_8)-cycloalkyl-(C_1–C_5)-alkyl; (C_6–C_{10})-aryl or (C_6–C_{10})-aryl-(C_1–C_5)-alkyl, both of which can optionally be substituted in the aryl moiety by one or two, identical or different, radicals from the series comprising carboxyl, amino, hydroxyl, (C_1–C_4)-alkoxy or halogen; (C_3–C_9)-heteroaryl or (C_3–C_6)-heteroaryl-(C_1–C_5)-alkyl;

A represents —O—, —NH— or a direct bond;

B denotes a radical of the formula IIIa or IIIb;



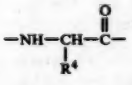
(IIIa)



(IIIb)

in which

X represents a radical of proline or 4-thiaproline or a radical of the formula IV



(IV)

in which

R^4 denotes hydrogen or (C_1–C_4)-alkyl which is optionally monosubstituted by hydroxyl, carboxyl, carbamoyl, meth-

ylthio, phenyl, 4-hydroxyphenyl, 4-imidazolyl or 3-indolyl;
m represents 2, 3 or 4,
n represents 0 or 1, and
Ar represents mono-, di- or trihydroxyphenyl, and
W denotes hydroxyl or a radical of the formula V

(V)

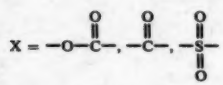
in which
R^1 denotes hydrogen, (C^1–C^6)-alkyl or (C^3–C^6)-cycloalkyl, and
R^2 denotes hydrogen, (C_1–C_6)-alkyl or (C_3–C_6)-cycloalkyl, or
R^1 and R^2 together represent —$[CH_2]_4$— or —$[CH_2]_5$—, it being possible for one $[CH_2]$group to be replaced by —O— or —S—,
and its physiologically tolerated salts.

4,797,472
NEW PEPTIDE DERIVATIVES
Stig I. Gustavsson, Mölndal, and Salo Arielly, Kungsbacka, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden
Filed Mar. 19, 1987, Ser. No. 27,969
Claims priority, application Sweden, Mar. 21, 1986, 8601329
Int. Cl.[4] C07K 5/08
U.S. Cl. 530—331 **22 Claims**

1. Tripeptide derivative characterized by the general formula:

$$R_1—X—D—Arg—A—Arg—NH—R_2$$

wherein R_1 is hydrogen, α- or β-naphtyl residue, lower alkyl residue which may be substituted with a carboxyl group, unsubstituted or substituted phenyl- or phenylalkyl residue, wherein the alkyl group having 1 to 4 carbon atoms and wherein said substituted phenyl is a phenyl substituted with a lower alkyl, lower alkoxy, halogen or nitro group

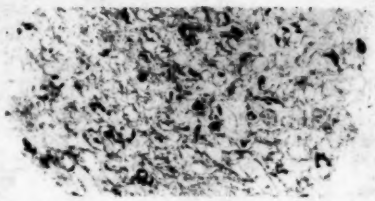


or a single bond with the proviso that when
R_1 is hydrogen then X is a single bond
A=Gly or Sar
R_2=an aromatic or heterocyclic residue which in conjunction with the NH moiety to which it is connected gives a compound R_2—NH_2 by enzymatic hydrolysis, which can be determined quantitatively,
or disalts and trisalts of inorganic or organic acids thereof.

4,797,473
MONOCLONAL ANTIBODIES TO UNREDUCED, NONENZYMATICALLY-GLYCATED PROTEINS
Joseph F. Tarsio, and Leo T. Furcht, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Jun. 25, 1986, Ser. No. 878,420
Int. Cl.[4] C07K 15/04; A61K 39/395; C12N 5/00; G01N 33/577
U.S. Cl. 530—387 **22 Claims**

16. A monoclonal antibody which binds to an epitope on an unreduced, nonenzymatically-glycated protein selected from the group consisting of total serum protein, fibronectin, transferrin and laminin, wherein said glycated protein comprises glucose attached to an epsilon-amino group of a lysine residue in the polypeptide chain of the protein, and which antibody does not substantially cross-react with the corresponding non-glycated protein as tested by enzyme-linked immunosorbent assay.

4,797,474
SOLUBILIZATION OF PROTEIN AGGREGATES
Joseph J. Patroni, Preston West, and Malcolm R. Brandon, Ivanhoe East, both of Australia, assignors to Bunge (Australia) Pty. Ltd., Australia
Filed Dec. 9, 1986, Ser. No. 939,578
Claims priority, application Australia, Dec. 11, 1985, PH 3818
Int. Cl.[4] C07K 3/12
U.S. Cl. 530—351 **20 Claims**



1. A method for the recovery of proteins which method includes providing a source of protein in an insoluble form, a source of at least one cationic surfactant; treating the insoluble protein with the at least one cationic surfactant, in the absence of denaturing guanidine hydrochloride and urea denaturing agents, in an amount sufficient to effect solubilisation without substantial modification to the structural backbone of the protein.

4,797,475
METHOD AND COMPOSITION FOR ISOLATING WHITE CELL ELEMENTS
Paul I. Terasaki, Los Angeles; Jimmy Loon, Reseda; Steven Hardiwidjaja, Simi Valley, and Nadim El-Awar, Burbank, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Continuation of Ser. No. 496,638, May 20, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 756,393
Int. Cl.[4] G01N 33/48, 1/18, 33/559, 33/53
U.S. Cl. 530—387 **18 Claims**

1. A composition of matter adapted for use in separating a given amount of a subpopulation of cells bearing a specific immunogenic marker from a heterogeneous cell suspension, said composition of matter consisting essentially of an aqueous solution of:
a sufficient amount of a monoclonal antibody which recognizes a specific immunogenic marker and is immunoreactive with a subpopulation of cells to form an antibody tagged subpopulation of cells, said subpopulation of cells being present within a heterogeneous cell suspension;
complement in an amount sufficient to provide lysing of substantially all of said antibody tagged subpopulation cells to provide lysed subpopulation cells having a density less than the density of the non-lysed cells in said heterogeneous cell suspension; and
a sufficient amount of a density gradient media consisting essentially of colloidal silica or cesium chloride to provide a solution after addition of said heterogeneous cell suspension having a density greater than said lysed subpopulation cells, but less than the density of the nonlysed cells in said heterogeneous cell suspension, said density gradient media being nontoxic with respect to the cells in said heterogeneous cell suspension.

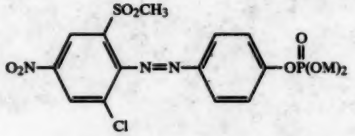
4,797,476

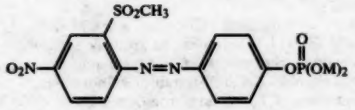
MONO-4-ARYLAZOARYL PHOSPHORIC ESTERS

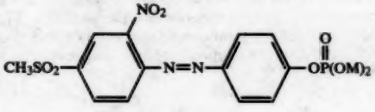
Yoshio Inagaki, and Masaki Okazaki, both of Minami-ashigara, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Japan

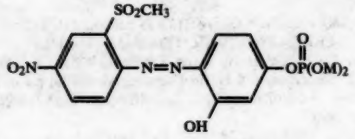
Continuation of Ser. No. 749,014, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 360,211, Mar. 22, 1982, abandoned. This application Sep. 10, 1986, Ser. No. 906,098
Claims priority, application Japan, Mar. 26, 1981, 56-44325
Int. Cl.[4] C07C *107/06, 107/08;* C09B *43/00, 62/825*
U.S. Cl. 534—727 13 Claims

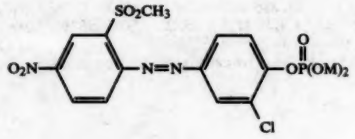
1. A phosphoric ester selected from the group consisting of:

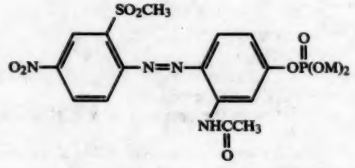


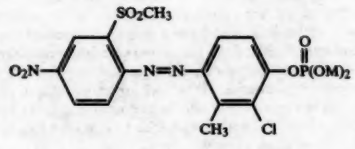












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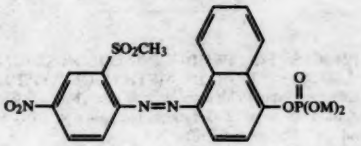
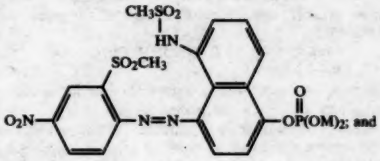
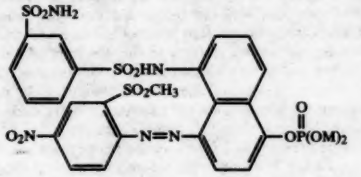




; and



wherein M is hydrogen, sodium or potassium.

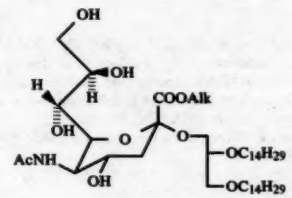
4,797,477

PROCESS FOR PREPARING SIALIC ACID DERIVATIVES

Shoji Yoshimura, Iruma; Yoichiro Tani; Youzi Matsuzaki, both of Tokorozawa; Masayoshi Ito, Kunitachi; Yoshiyasu Shitori, Tokyo, and Tomoya Ogawa, Musashino, all of Japan, assignors to Meet Corporation, Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 84,018
Claims priority, application Japan, Aug. 12, 1986, 61-189340
Int. Cl.[4] C07H *5/06, 15/04*
U.S. Cl. 536—18.5 7 Claims

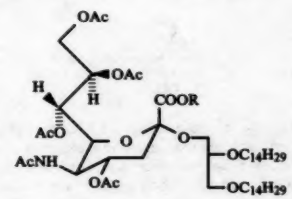
1. A process for preparing a compound represented by the formula:



(3)

wherein Ac is acetyl and Alk is an alkali metal, consisting essentially of:

hydrolyzing, in a single step, a compound of the formula:



(1)

wherein Ac is as defined above and R is C_{1-5} alkyl, in an aqueous ROH solution of an alkali metal hydroxide.

4,797,478

PROCESS FOR PRODUCING COLOR-STABLE, INDUSTRIAL-GRADE METHYL GLUCOSIDE

Rolf Lebuhn; John Feldmann, and Hubert Koebernick, all of Krefeld, Fed. Rep. of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 23, 1987, Ser. No. 29,496

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1986, 3611035

Int. Cl.[4] C07H *1/00, 15/04*; C07G *3/00*

U.S. Cl. 536—18.5 **22 Claims**

1. A process for producing a color-stable, industrial-grade methyl glucoside which comprises:

(a) first heating a mixture of glucose and excess methanol in the presence of an acidic catalyst under conditions which exclude water until the reaction product mixture contains less than about 20% glucose on a dry weight basis;

(b) then heating the reaction product mixture with an excess of a higher-boiling alcohol in the presence of an acidic catalyst under conditions for the continuous azeotropic removal of water until the glucose content of the mixture is about 0.3% or less on a dry substance basis, said higher-boiling alcohol being one that boils above 80° C. at atmospheric pressure and forms an azeotrope with water; and

(c) separating unreacted higher-boiling alcohol from the mixture obtained in Step (b).

15. A process for producing a color-stable, industrial-grade methyl glucoside which comprises:

(a) heating a mixture of glucose and excess of a higher-boiling alcohol in the presence of an acidic catalyst under conditions for the continuous azeotropic removal of water until the glucose content of the reaction product mixture measured as a D.E. value is below about 0.2% on a dry weight basis, said higher-boiling alcohol being one that boils above 80° C. at atmospheric pressure and forms an azeotrope with water;

(b) separating unreacted alcohol from the reaction product mixture of Step (a); and

(c) reacting the mixture obtained in Step (b) with an excess of methanol in the presence of an acidic catalyst until the methyl glucoside content of the resulting product is at least 60% on a dry weight basis.

4,797,479

NUCLEOSIDE-PHOSPHOLIPID CONJUGATE

Satoshi Shuto; Hiromichi Ito; Kiyofumi Fukukawa; Hideo Sakakibara, and Masatoshi Tsujino, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

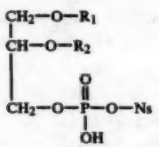
Filed Apr. 15, 1986, Ser. No. 852,881

Claims priority, application Japan, Apr. 15, 1985, 60-78283; Oct. 25, 1985, 60-237695

Int. Cl.[4] C07H *19/10, 19/20*; C07D *473/00*

U.S. Cl. 536—27 **5 Claims**

1. A compound of the formula



wherein R_1 and R_2 are long-chain fatty acid residue, and Ns is neplanocin A-6'-yl- or a nucleoside residue selected from the group consisting of 5-fluorouridine-5'-yl, and arabinocyl-5-fluorocytosine-5'-yl-, and pharmacologically acceptable salts thereof.

4,797,480

NEW BIOLOGICALLY ACTIVE FLUORESCENT CYCLIC NUCLEOTIDES

Robert T. Sorbi; Antonio Caretta; Andrea Cavaggioni, and Liliana Marchesi Gastaldi, all of Parma, Italy, assignors to Universita Degli Studi di Parma, Parma, Italy

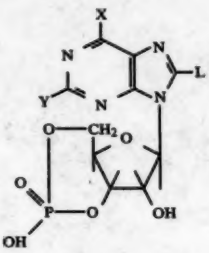
Filed May 23, 1986, Ser. No. 866,354

Claims priority, application Italy, Jun. 6, 1985, 42506 A/85

Int. Cl.[4] C07H *19/10, 19/20*

U.S. Cl. 536—27 **11 Claims**

1. Biologically active cyclic nucleotides made fluorescent by inserting a fluorescent group, represented by the formula:



(I)

wherein:

X is OH or NH_2, Y is NH_2 when X=OH and is H when X=NH_2 and L is a fluorescent group selected from: 5-thioacetamido-fluorescein, 6-thioacetamido-fluorescein, 5-thioacetamido-2',4',5',7'-tetrabromofluorescein, 6-thioacetamido-2',4',5',7'-tetrabromofluorescein, 5-thioacetamido-2',4',5',7'-tetraiodo-fluorescein, 6-thioacetamido-2',4',5',7'-tetraiodofluorescein, 5-(2-thioacetamido-ethyl)-amino-naphthalene-1-sulphonic acid, and 8-(2-thioacetamido-ethyl)-amino-naphthalene-1-sulphonic acid.

4,797,481

SURFACTANTS DERIVED FROM DI- OR TRI-CARBOXYLIC HYDROXY-ACIDS

Salvatore Garlisi, Vercelli; Luigi Turchini, Milan; Aurelio Albanini, Casteggio, and Dario Fornara, Massiola, all of Italy, assignors to Raffineria Olii Lubrificanti "R.O.L." S.p.A., Milan, Italy

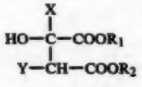
Filed Aug. 24, 1987, Ser. No. 88,382

Claims priority, application Italy, Aug. 28, 1986, 21540 A/86

Int. Cl.[4] C07H *15/04, 13/02, 15/00*; B01F *17/00*

U.S. Cl. 536—116 **11 Claims**

1. Esters of di- or tri-carboxylic hydroxyacids having the formula:



(I)

wherein:

X is H or a $—CH_2COOR$ group;

Y is H or —OH, with the proviso that Y is H when X is $—CH_2COOR$;

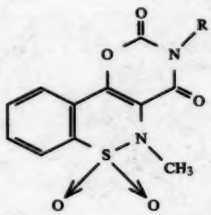
R, R_1, R_2, which may be the same or different, represent a hydrogen atom, an alkali or alkaline-earth metal, an ammonium group, the cation of an ammonium organic base, or an A radical derived from a polyhydroxylated organic compound selected from the group consisting of etherified (C_6–C_{16}) alkyl polysaccharides containing from 2 to 6 monomeric saccharide units and etherified (C_6–C_{16}) hydroxyalkyl aliphatic polyalcohols containing from 2 to 16 hydroxyl radicals, with the proviso that at least one of said R, R_1, R_2 is an A radical.

4,797,482
PROCESS FOR THE PREPARATION OF OXAZINOBENZOTHIAZINE 6,6-DIOXIDE DERIVATIVES

Jordi F. Constansa; Augusto C. Pinol, and Juan P. Corominas, all of Barcelone, Spain, assignors to Provesan S.A., Geneva, Switzerland

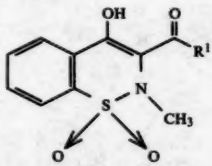
Filed Apr. 15, 1987, Ser. No. 39,518
Claims priority, application France, Apr. 15, 1986, 86 05377
Int. Cl.[4] C07D *498/04, 513/04*
U.S. Cl. 544—33 7 Claims

1. A process for the preparation of a 5-methyl-3-heteroaryl-2H,5H-1,3-oxazino-[5,6-c[1,2]benzothiazine-2,4-(3H)-dione 6,6 dioxide of the formula I:



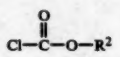
(I)

in which R represents a pyrimidinyl or pyridyl group, consisting in reaction an amide of the general formula II:



(II)

in which R^1 represents a pyrimidinylamino or pyridylamino group, with a compound of the general formula III:



(III)

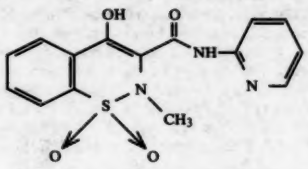
in which R^2 represents a C_1 to C_4 lower alkyl radical, an aryl radical or an alkylaryl radical,
wherein the reaction is carried out in an organic solvent selected from the group consisting of pyridine, 4-dimethylaminopyridine, 4-(pyrrolidin-1-yl)pyridine and 2,6-ditert.-butyl-4-methylpyridine, and mixtures thereof.

4,797,483
PROCESS FOR OBTAINING 4-HYDROXY-2-METHYL-N-(2-PYRIDYL)-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE

Jordi Frigola Constansa; Jose M. Ribalta Baro, and Julio Campon Pardo, all of Barcelone, Spain, assignors to Induspol, S.A., Barcelona, Spain

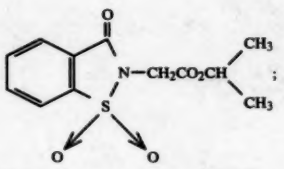
Filed Jun. 24, 1987, Ser. No. 66,711
Claims priority, application Spain, Mar. 27, 1987, 8700867
Int. Cl.[4] C07D *279/16*
U.S. Cl. 544—49 1 Claim

1. A process for manufacturing 4-hydroxy-2-methyl-N-(2-pyridyl)-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide, of formula I,



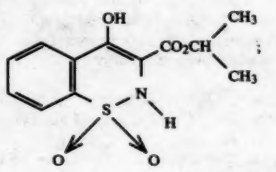
(I)

which comprises the following reaction sequence: reacting saccharin sodium with isopropyl chloroacetate in dimethylformamide to obtain isopropyl 3-oxo-1,2-benzoisothiazoline-2-acetate 1,1-dioxide, of formula II



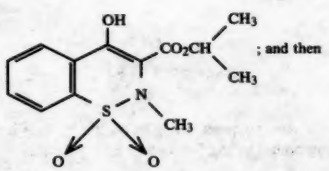
(II)

reacting the isopropyl 3-oxo-1,2-benzoisothiazoline-2-acetate 1,1-dioxide of formula II with sodium isopropylate in isopropanol at a temperature between 60° C. and the boiling point of the solvent, for a time between 15 minutes and 3 hours, to produce an intermediate of formula III



(III)

methylating the intermediate of formula III in an aqueous-alcoholic basic medium with dimethyl sulfate to produce an intermediate compound of formula IV



(IV)

condensing the intermediate compound of formula IV with 2-aminopyridine in xylene to obtain a final product of formula I.

4,797,484

PROCESS FOR THE PREPARATION OF N'-SULPHONYL- AND N',N''-BIS-SULPHONYL-GUANIDINE DERIVATIVES

Koichi Moriya, Hachioji, Japan; Theodor Pfister, Monheim, Fed. Rep. of Germany; Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Ludwig Eue, Leverkusen, Fed. Rep. of Germany; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach,, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

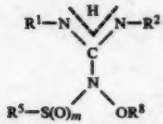
Continuation-in-part of Ser. No. 853,822, Apr. 18, 1986, Pat. No. 4,721,785, which is a division of Ser. No. 578,345, Feb. 9, 1984, Pat. No. 4,602,938. This application Jan. 16, 1987, Ser. No. 5,800

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307679; Sep. 23, 1983, 3334455

Int. Cl.[4] C07D *251/26, 215/16, 213/62*

U.S. Cl. 544—215 11 Claims

1. A process for the preparation of a guanidine derivative of the formula



in which

R_1 represents hydrogen or the radical $R^5—S(O)_m—$,

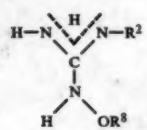
m represents the numbers zero, 1 or 2 and

R^5 represents a radical selected from the group consisting of alkyl aralkyl, pyridyl, quinolinyl, furyl, thienyl and pyrrolyl,

R^2 represents a six-membered aromatic heterocyclic structure selected from the group consisting of pyridyl, pyrimidinyl and 1,3,5-triazinyl and which is substituted by halogen, amino, cyano or formyl and/or by optionally substituted radicals from the group consisting of alkyl, alkoxy, alkylamino, dialkylamino, alkylcarbonyl and alkoxycarbonyl, and

R^8 represents an optionally substituted radical from the group consisting of C_1–C_6-alkyl, alkenyl, alkinyl, cycloalkyl, phenylallkyl and aryl,

which comprises reacting a guanidine derivative of the formula



with one or two molar equivalent(s) respectively, of a halogen/sulphur compound of the formula

$$R^5—S(O)_m—X^1$$

in which

X^1represents fluorine, chlorine or bromine.

4,797,485

PLATINUM-FLAVIN ANTI-TUMOR COMPLEXES

Yoshinori Kidani, and Masahide Noji, both of Nagoya, Japan, assignors to Yoshinori Kidani, Japan

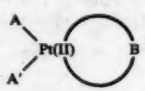
Filed Sep. 17, 1987, Ser. No. 99,301

Claims priority, application Japan, Sep. 19, 1986, 61-219429

Int. Cl.[4] A61K *31/555, 31/675, 475/14;* C07F *9/65*

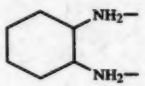
U.S. Cl. 544—225 6 Claims

1. An anti-tumor platinum(II)-flavin complex represented by the general formula (I)

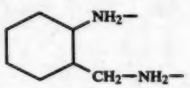


(I)

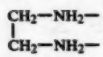
wherein A and A' taken together form a 1,2-cyclohexanediamine ligand of the formula:



where the 1- and 2-amino groups have a configuration selected from cis-, trans-l- and trans-d-,relative to the cyclohexane ring; or A and A' taken together form a 2-(aminomethyl)cyclohexylamine ligand of the formula:

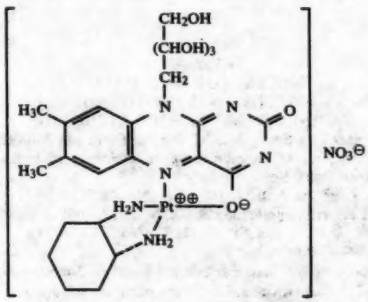


where the 1-amino group and 2-aminomethyl group have a configuration selected from cis-l-, cis-d-, trans-l and trans-d-, or a mixture thereof, relative to the cyclohexane ring; or A and A' taken together form an ethylenediamine ligand of the formula:



A and A' each denote NH_3-, and B denotes riboflavin or riboflavin-mononucleotide which coordinates the platinum atom, or a nitrate of the platinum(II)-flavin complex of the formula (I).

4. Riboflavin-(trans-l-1,2-cyclohexanediamine) platinum(II) complex nitrate of the formula:

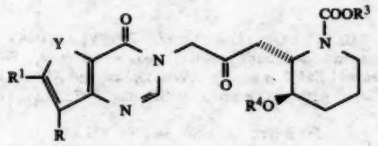


4,797,486
HETEROCYCLIC RING FUSED PYRIMIDINE-4(3H)-ONES AS ANTICOCCIDIAL AGENTS

Edward A. Glazer, Waterford, and James W. McFarland, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 913,884, Sep. 8, 1986, Pat. No. 4,725,599. This application Oct. 14, 1987, Ser. No. 108,172
Int. Cl.[4] C07D *495/04, 491/048*
U.S. Cl. 544—250 14 Claims

1. A compound of the formula



wherein Y is sulfur or oxygen;

R and R^1 are taken separately, R is hydrogen, chloro or bromo and R^1 is chloro or bromo; or

R and R^1 are taken together and are —CH=CH—CH=CH—; with the proviso that R and R^1 are taken together when Y is oxygen;

R^3 is allyl or $(C_1–C_4)$alkyl; and

R^4 is hydrogen or $(C_1–C_4)$alkyl.

4,797,487
PRODUCTION OF BICYCLIC GUANIDINES FROM BIS(AMINOALKYL)AMINE

Richard A'Court, Beverley, England, assignor to BP Chemicals Ltd., London, England

Filed Apr. 4, 1986, Ser. No. 848,819
Claims priority, application United Kingdom, Apr. 13, 1985, 8509531
Int. Cl.[4] C07D *487/04*
U.S. Cl. 544—279 4 Claims

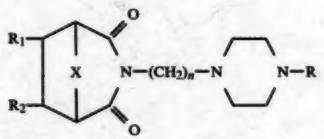
1. A process for the production of bicyclic guanidines which process comprises reacting in one step a bis(aminoalkyl)amine selected from the group consisting of bis(2-aminoethyl)amine and bis(3-aminopropyl)amine, at a temperature in the range from 10° to 200° C., with carbon disulphide and in a high boiling hydrocarbon solvent.

4,797,488
PSYCHOTROPIC POLYCYCLIC IMIDES

Gary P. Stack, Merion; Thomas D. Golobish, Devon, both of Pa., and Magid A. Abou-Gharbia, Wilmington, Del., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 3, 1987, Ser. No. 34,820
Int. Cl.[4] C07D *401/14, 403/14, 413/14, 417/14*
U.S. Cl. 544—295 17 Claims

1. A compound of the formula:



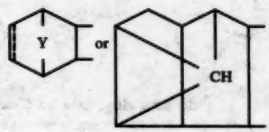
in which

X is —O—, —S—, —SO—, $—SO_2—$, $—CR_3R_4—$ where R_3 and R_4, independently, are hydrogen, alkyl of 1 to 4 carbon atoms or, taken together with the carbon atom to which they are attached, R_3 and R_4 form a cycloalkyl group of 3 to 5 carbon atoms;

n is one of the integers 2, 3, 4 or 5;

R is phenyl, halophenyl, trifluoromethylphenyl, alkoxyphenyl in which the alkoxy substituent contains 1 to 3 carbon atoms, 2-pyrimidinyl, halopyrimidin-2-yl, 2-pyrazinyl, halopyrazin-2-yl, 2-pyridinyl, halopyridin-2-yl, cyanopyridin-2-yl, quinolyl, or haloquinolyl;

R_1 and R_2, taken together, are alkylene of 3 to 5 carbon atoms or alkenylene of 3 to 5 carbon atoms, or taken with the carbon atoms to which they are attached, R_1 and R_2 complete a benzene ring, or a group of the formula:



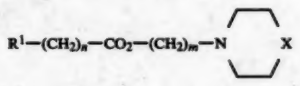
where Y is $—CH_2—$, $—CH_2—CH_2—$, —O— or —S— and the dotted line represents optional unsaturation; or a pharmaceutically acceptable salt thereof.

4,797,489
ADAMANTYL- AND FLUORENYL-ARYLPIPERAZINES AND -ARYLPIPERIDINES

Magid A. Abou-Gharbia, Wilmington, Del.; Gary P. Stack, Merion, and John P. Yardley, Gulph Mills, both of Pa., assignors to American Home Products Corp., New York, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,740
Int. Cl.[4] C07D *295/14*
U.S. Cl. 544—331 14 Claims

1. A compound of the formula:



wherein

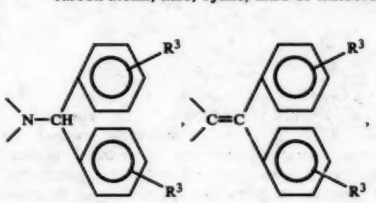
R^1 is 1-adamantyl, 3-methyl-1-adamantyl, 9-fluorenyl or 1-fluorenyl;

n is 0 or 1;

m is 1, 2, 3, 4 or 5; and

X is

where R^2 is phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, or substituted phenyl or benzyl in which the substituent is alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano, nitro or trifluoromethyl,



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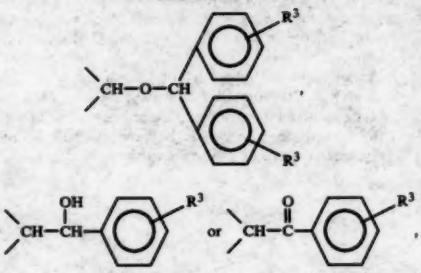


where R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano or nitro; or a pharmaceutically acceptable salt thereof.

4,797,490

PROCESS FOR THE PREPARATION OF 3-(2'-FLUOROPHENYL)PYRIDINE

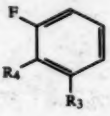
Paul J. Gilligan, New Haven; Paul R. McGuirk, Gales Ferry, both of Conn., and Michael J. Witty, Dover, Great Britain, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 679,148, Dec. 6, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,176

Int. Cl.[4] C07D *213/26*

U.S. Cl. 546—290 **8 Claims**

1. A process for preparing a compound of the formula



wherein R_3 is hydrogen or fluoro; and R_4 is 3-pyridyl which may be substituted by one or two substituents selected from the group consisting of fluoro, chloro, hydroxy, alkoxy of 1 to 4 carbon atoms, amino, alkylamino of 1 to 4 carbon atoms, dialkylamino of 2 to 8 carbon atoms, carboxy, hydroxalkyl of 1 to 6 carbon atoms, aminoalkyl of 1 to 6 carbon atoms and, said hydroxy, amino, carboxy, hydroxyalkyl, aminoalkyl in suitably protected form, which comprises reacting at rool temperature to 50° C. a phenylzinc compound of the formula

wherein R_3 is as defined above and M is zinc or a zinc halide group, with a compound of the formula R_4 Hal wherein R_4 is as defined above and Hal is bromo or iodo in the presence of a transition metal catalyst complex comprising a transition metal in the (0) or (II) oxidation state and a phosphine containing ligand, and removing any protecting group in any of the above suitably protected forms.

4,797,491

COMPOUND 1-(3-(2-PYRIDYLDITHIO)PROPIONAMIDO)-12-(5-HYDRAZIDOGLUTARAMIDO)-4,9-DIOXADODECANE

Danute E. Nitecki, and Margaret Moreland, both of Berkeley, Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Mar. 17, 1986, Ser. No. 840,604

Int. Cl.[4] C07D *213/71*

U.S. Cl. 546—291 **1 Claim**

1. The compound 1-(3-(2-pyridyldithio)propionamido)-12-(5-hydrazidoglutaramido)-4,9-dioxadodecane.

4,797,492

POLYFLUOROALKYLISOXAZOLYLAMINES

Shinzaburo Sumimoto, Ashiya; Ichiro Ishizuka, Toyono; Hiroyuki Kai, Koka; Shiro Ueda, Osaka, and Akira Takase, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Oct. 22, 1986, Ser. No. 921,415

Claims priority, application Japan, Oct. 23, 1985, 60-238344

Int. Cl.[4] C07D *261/14*

U.S. Cl. 548—245 **23 Claims**

1. A compound of the formula:

(I)

in which:

R is sufluoro C_{1-14} alkyl; R^1 is C_{1-5} alkyl, chlorine, bromine, iodine, phenyl, phenyl substituted with one or an plurality of substituents selected from the group consisting fluorine, shlorine, C_{1-4} alkyl and C_{1-4} alkoxy or phenyl substituted with methylendioxy or ethylene dioxy; and R^2 is hydrogen or C_{1-4} alkyl, or a salt of thereof.

4,797,493

BENZYLIDENE COMPOUNDS

Kazuhiro Matsuno, deceased, late of Kawasaki (by Chieko Matsuno, legal representative); Toru Kobayashi, Kawasaki; Takeshi Miyoshi, Kawasaki, and Hideaki Kawashima, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

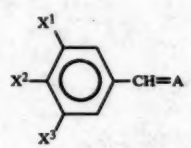
Filed Apr. 14, 1987, Ser. No. 38,364

Claims priority, application Japan, Apr. 22, 1986, 61-92481; Oct. 16, 1986, 61-246308; Oct. 16, 1986, 61-246309; Nov. 14, 1986, 61-271287

Int. Cl.[4] C07D *233/64*

U.S. Cl. 548—312 **7 Claims**

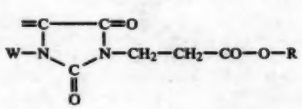
1. A benzylidene compound represented by the formula (I):



(I)

wherein

A represents



wherein

W is a hydrogen atom or a group —CH_2—CH_2—CO—R;

X^1, X^2 and X^3 each represents independently a hydrogen atom, a hydroxyl group or a methoxyl group, wherein two or three of X^1, X^2 and X^3 are the same or all are different; and

R is a straight chain alkyl group having 1 to 18 carbon atoms, or a branched or cyclic alkyl group having 3 to 18 carbon atoms,

provided that when X^1, X^2 and X^3 are a hydrogen atom, R is a straight chain, a branched or a cyclic alkyl group having 3 to 18 carbon atoms.

4,797,494

CARBAMIC ACID DERIVATIVES AND METHOD FOR PREPARING SAME

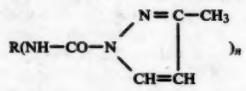
Mikhail G. Ivanov, prospekt Tsiolkovskogo, 31, kv. 47; Veniamin G. Golov, prospekt Pobedy 3, kv. 11, both of Dzerzhinsk Gorkovskoi oblasti; Vladimir N. Kuzmin, ulitsa Doboselskaya, 195-a, kv. 48; Aida I. Alyakrinskaya, ulitsa Voroshilova, 6, kv. 2, both of Vladimir; Roman Y. Mushy, Gvardeisky prospekt, 45, kv. 15; Alexei D. Kovalev, prospekt Kosmonavtov, 15, kv. 46, both of Severodonetsk Voroshilovgradskoi oblasti; Nadezhda V. Shutova, prospekt Leninskogo Komsomola, 42, kv. 103, Dzerzhinsk Gorkovskoi oblasti; Jury A. Rodionov, prospekt Tsiolkovskogo, 81, kv. 31, Dzerzhinsk Gorkovskoi oblasti; Igor I. Molev, ulitsa Griboedova, 36, kv. 22, Dzerzhinsk Gorkovskoi oblasti; Ljudmila S. Yakovleva, Balaklavsky prospekt, 20, korpus 1, kv. 52, Moscow; Vitaly B. Berezin, Ryazansky prospekt, 51, kv. 106, Moscow; Alexei I. Petrashko, ulitsa Tashkentskava, 24, korpus 1, kv. 181, Moscow; Gennady M. Shuev, ulitsa Prosojuznaya, 18, kv. 64; Boris A. Bukin, ulitsa Profsojuznaya, 40, kv. 17, both of Narofominsk Moskovskoi oblasti; Tamara M. Belkina, deceased, late of Moscow, and by Naum S. Belkin, administrator, ulitsa Flotskaya, 18, kv. 94, Moscow, all of U.S.S.R.

Division of Ser. No. 573,795, Jan. 25, 1984, Pat. No. 4,623,931. This application Aug. 28, 1986, Ser. No. 901,753

Int. Cl.[4] C07D *231/10*

U.S. Cl. 548—374 **4 Claims**

1. A compound of the formula



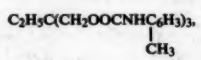
wherein R is selected from the group consisting of

$$NH(CONHCH_2CH_2OOCNHC_6H_4CH_2C_6H_4)_2$$

wherein n=2

$$C_6H_4CH_2C_6H_4NHCOO[CH_2CH_2COO(CH_2)_4COO]_gCH_2CH_2OOCNHC_6H_4CH_2—C_6H_4—,$$

in which g=8–14 wherein n=2, and



wherein n=3.

4,797,495

BENZO[C]CARBAZOLE PROPANEDIOL COMPOUND AND SALTS THEREOF

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 801,087, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,356, Nov. 20, 1984, abandoned. This application Dec. 4, 1987, Ser. No. 128,638

Int. Cl.[4] C07D *209/80*

U.S. Cl. 548—420 **5 Claims**

1. 2-methyl-2-[[(7-methyl-7H-benzo[c]carbozol-10-yl)methyl]amino]-1,3-propanediol.

4,797,496

PROCESS FOR THE PREPARATION OF PYRROLIDONE DERIVATIVES

Mario Pinza, Corsico, and Ugo C. Pfeiffer, Milan, both of Italy, assignors to I.S.F. Societa Per Azioni, Milan, Italy

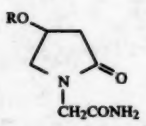
Continuation of Ser. No. 92,250, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 705,818, Feb. 26, 1985, abandoned. This application Mar. 8, 1988, Ser. No. 165,340

Claims priority, application Italy, Feb. 27, 1984, 19802 A/84

Int. Cl.[4] C07D *207/12*

U.S. Cl. 548—544 **24 Claims**

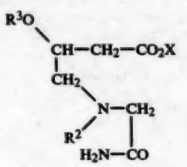
1. A process for preparing a pyrrolidinone derivative of structure (1)



(1)

in which R is hydrogen, comprising:

(a) N-deprotecting a compound of structure (2)



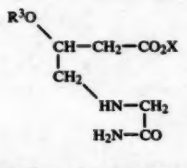
(2)

wherein

R^2 is benzyl, α-methylbenzyl or p-methoxybenzyl;

R^3 is hydrogen, and X is straight or branched alkyl containing 1 to 10 carbon atoms;

to give a compound of structure (3)



(3)

wherein X and R^3 are as defined above; and

(b) cyclizing the compound of structure (3) intramolecularly by heating at 0° to 120° C.

4,797,497

TRIMELLITIC ANHYDRIDE PURIFICATION PROCESS

Wayne P. Schammel, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 25, 1988, Ser. No. 160,187
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—245 4 Claims

1. A process for purifying trimellitic anhydride prepared by the oxidation of a reaction mixture comprising a dilute solution of pseudocumene in a lower fatty acid having two to four carbon atoms containing minor portions of water which comprise the direct mixing of the molten trimellitic anhydride with pseudocumene at a temperature of about 200° F. to about 450° F. to dissolve said molten trimellitic anhydride in said pseudocumene for a period of about 10 to about 210 minutes and crystallizing the purified trimellitic anhydride at a temperature of about 80° F. to about 400° F. and then cooling the resulting mixture to produce crystalline trimellitic anhydride from the pseudocumene.

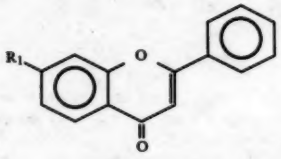
4,797,498

FLAVONOXYPROPANOLAMINES AND ESTERS OF FLAVONOXYPROPANOLAMINES AS ANTIARRHYTHMIC AGENTS

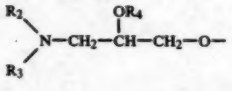
William L. Albrecht, and Edwin S. Wu, both of Rochester, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 18, 1986, Ser. No. 887,670
Int. Cl.[4] C07D *311/30*
U.S. Cl. 549—403 11 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein
R_1 is



R_2 is n-propyl or i-propyl,
R_3 is hydrogen, and
R_4 is benzoyl or diphenylacetyl and is benzoyl only when R_2 is i-propyl.

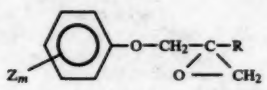
4,797,499

FUNGICIDAL AND PLANT GROWTH-REGULATING NOVEL SUBSTITUTED 1-HYDROXYALKYL-AZOLYL DERIVATIVES

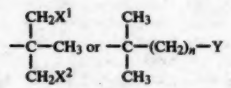
Graham Holmwood; Erik Regel, both of Wuppertal; Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 683,891, Dec. 20, 1984, Pat. No. 4,734,126, which is a continuation of Ser. No. 458,086, Jan. 14, 1983, abandoned. This application Aug. 11, 1986, Ser. No. 895,089
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202601
Int. Cl.[4] C07D *303/08*
U.S. Cl. 549—559 6 Claims

1. An oxirane of the formula



in which
R is



X^1 is hydrogen, fluorine, chlorine or bromine,
X^2 is fluorine, chlorine or bromine,
Y is methoxy, ethoxy, methylthio, ethylthio, trifluoromethoxy, vinyl, phenyl or phenyl substituted by a radical selected from the group consisting of fluorine, chlorine and methyl, or is phenoxy or phenoxy substituted by a radical selected from the group consisting of fluorine, chlorine, methyl and phenyl, or is phenylthio or phenylthio substituted by a radical selected from the group consisting of fluorine, chlorine and methyl, and,
n is 0, 1 or 2,
Z is a halogen atom or an alkyl having 1 to 4 carbon atoms, cycloalkyl having 5 to 7 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, unsubstituted phenyl or phenyl substituted by a substituent selected from the group consisting of halogen and C_1–C_4-alkyl, phenylalkyl having 1 to 2 carbon atoms in the alkyl part and being unsubstituted or substituted by a substituent selected from the group consisting of halogen and C_1–C_4-alkyl, phenylakoxy having 1 to 2 carbon atoms in the alkoxy part and being unsubstituted or substituted by a substituent selected from the group consisting of halogen and C_1–C_4-alkyl, and alkylthio, halogenalkyl, halogenoalkoxy, halogenoalkylthio, optionally substituted phenyl, optionally substituted phenylalkyl or optionally substituted phenylalkoxy group, and
m is 0, 1, 2 or 3.

4,797,500

PURIFICATION OF ORGANOMETALLIC COMPOUNDS

Hidekimi Kadokura; Kenichi Sawara, and Tadaaki Yako, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation of Ser. No. 938,985, Dec. 3, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 184,115
Claims priority, application Japan, Dec. 3, 1985, 60-272228
Int. Cl.[4] C07F *5/00, 5/06*
U.S. Cl. 556—1 4 Claims

1. A method for purifying a trialkylmetallic compound of the formula R_3M wherein R represents an alkyl group of 1-4 carbon atoms and M represents gallium, aluminum or indium, which comprises contacting said trialkylmetallic compound with at least one metallic sodium, metallic potassium or metallic potassium alloy at a temperature and a time sufficient to remove impurities, including silicon impurities, from the trialkylmetallic compound, wherein the molar ratio of the total of sodium and potassium to the trialkylmetallic compound is 0.05 to 0.6.

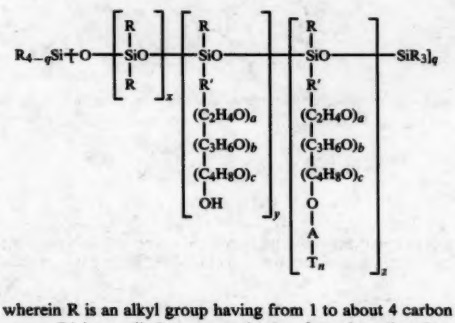
4,797,501

SILICONE-BASED STABILIZERS USEFUL IN THE PREPARATION OF IMPROVED POLYURETHANE FOAMS

Richard C. Myerly; Michael W. Jorgenson, both of Charleston, and Frank E. Critchfield, South Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 948,000, Dec. 31, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 107,343
Int. Cl.[4] C08G *18/14*
U.S. Cl. 556—445 9 Claims

1. A polymer/polyol stabilizer of the general formula



wherein R is an alkyl group having from 1 to about 4 carbon atoms; R' is an alkylene group having from 3 to 6 carbon atoms; a is an integer having a value of from 0 to about 100; b is an integer having a value of from 0 to about 100; c is an integer having a value of from 0 to about 100; the sum of a+b+c is at least 5; the values of a, b and c may be the same or different within y and z groups; g is an integer having a value of from 0 to 3; x is an integer having a value of from 0 to about 200; z has a value of from about 0.2 to about 3.0; y+z has a value of from about 3 to about 50; A is a reactive unsaturated group, T is an alkylene oxide group, and n is an integer having a value of from 0 to about 3.

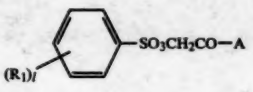
4,797,502

SULFONIC ACID ESTER DERIVATIVES AND PROCESS FOR PREPARING SAME

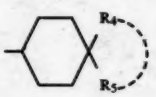
Setsuro Fujii, Toyonaka; Kazuo Ogawa, Tokushima; Toshihiro Hamakawa, Naruto, and Yoshiyuki Muranaka, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Division of Ser. No. 861,635, May 7, 1986, Pat. No. 4,675,428, which is a continuation-in-part of Ser. No. 609,568, Apr. 30, 1984, abandoned. This application Jan. 20, 1987, Ser. No. 4,610
Claims priority, application Japan, Sep. 6, 1982, 57-155675; Nov. 24, 1982, 57-206579
Int. Cl.[4] C07C *143/68*
U.S. Cl. 558—52 4 Claims

1. A sulfonic acid ester derivative represented by the general formula



wherein R_1 is a hydrogen atom, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms, A is a group represented by the general formula



wherein R_4 and R_5 are each alkyl having 1 to 4 carbon atoms or, when taken together with the carbon atom to which they are attached, form cycloalkyl having 4 to 6 carbon atoms, and l is an integer of from 1 to 3.

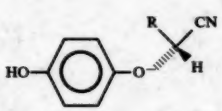
4,797,503

CHIRAL 1-CYANOALKOXY 4-HYDROXYPHENYL DERIVATIVES

Kirk F. Eldman, and David M. Walba, both of Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 880,851, Jul. 1, 1986. This application Jan. 15, 1988, Ser. No. 144,001
Int. Cl.[4] C07C *121/52*
U.S. Cl. 558—389 9 Claims

1. A compound of the formula:



wherein R is an alkyl of one to twelve carbon atoms.

4,797,504

METHOD AND COMPOSITION FOR INHIBITING ACRYLATE ESTER POLYMERIZATION

Paul V. Roling, Spring, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 7, 1986, Ser. No. 916,267
Int. Cl.[4] C07C *67/62*
U.S. Cl. 560—4 18 Claims

1. A method of inhibiting acrylate monomer polymerization at elevated temperatures comprising adding to the acrylate monomer an effective amount of (a) a hydroxylamine having the formula

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wherein R and R' are the same or different and are hydrogen, alkyl, aryl, alkaryl or aralkyl groups and (b) a phenylenediamine or derivative thereof having at least one N-H group.

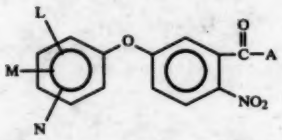
4,797,505

PROCESS FOR THE PREPARATION OF SUBSTITUTED DIPHENYL ETHERS

Michael J. Brown, Randolph, and Kou-Chang Liu, Wayne, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Mar. 17, 1982, Ser. No. 358,974
Int. Cl.[4] C07C 79/46
U.S. Cl. 560—021 **29 Claims**

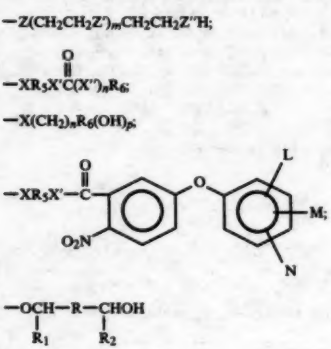
1. The process for the preparation of substituted diphenyl ethers having the formula:



1.

wherein L, M and N are independently hydrogen, halogen, trihalomethyl, nitro, cyano, C_{1-4} alkyl, C_{1-4} alkoxy and

and A is selected from the group of radicals defined by the formulae:



I

II

III

IV

V

and

VI

wherein

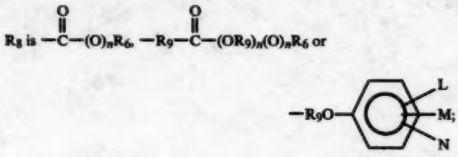
R is an unsaturated, straight chain or branched aliphatic radical having from 2 to 8 carbon atoms;

R_1 and R_2 are independently hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 and R_4 are independently hydrogen, or a saturated or unsaturated straight or branched chain C_{1-8} aliphatic radical optionally substituted with halogen, hydroxy, alkoxy, cyano or nitro;

R_5 is a saturated or unsaturated, straight chain or branched aliphatic hydrocarbon radical of from 1 to 18 carbon atoms wherein one or more of the —CH_2— groups can be replaced with —O—, —S—, —S—S—, —SO— or —SO_2— and said hydrocarbon radical is optionally substituted with halogen, trihalomethyl, cyano, aryl, hydroxy, alkoxy, nitro or cycloalkyl having 3 to 6 carbon atoms;

R_6 is a saturated or unsaturated straight chain or branched aliphatic radical containing from 1 to 8 carbon atoms, optionally substituted with halogen, trihalomethyl, cyano, hydroxy, nitro, acetoxy, alkoxy, thioalkoxy or aryl; an aryl radical optionally substituted with halogen, trihalomethyl, hydroxy, cyano, nitro, alkyl or alkoxy; a cyclic 3–6 membered alkylene ring or a 5–6 membered alkenylene ring or benzyl optionally substituted with halogen, trihalomethyl, alkyl, hydroxy, alkoxy or cyano;



each R_9 is independently an alkylene diradical having from 1 to 4 carbon atoms;

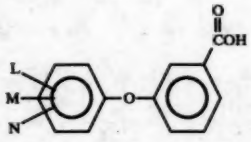
X, X' and X'' are independently —O—, —S— or —NR_4—;

Z and Z'' are independently, —O— or —S—, Z'' additionally can be thiol or —SO_3—; and Z' is —S—, —S—S—, —SO— or —SO_2—;

p has a value of 2–6; n in each instance, has a value of 0 or 1; and

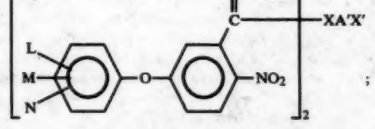
m has a value of 1–6;

which comprises reacting a correspondingly substituted phenoxybenzoic acid having the formula



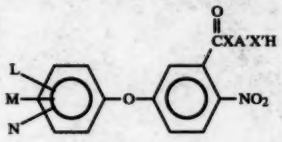
with about a stoichiometric amount of a diacylating agent having the formula HX—A'—X'H where A' is R_5,

to produce the corresponding bis compound and then nitrating the bis compound to produce a compound having the formula



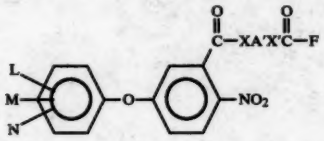
and then optionally transacylating the bis compound with an excess of said diacylating agent, preferably in the presence of a

transacylating catalyst, to produce the compounds of formula 1 where A is I, III or V, namely



and further optionally reacting the product of transacylation where A' is R_5 with a carbonyl-containing compound of the formula

or the acid halide or anhydride of such carbonyl-containing compounds to produce the compounds of formula 1 where A is II or VI, namely



where F is R_8 or $(X'')_nR_6$.

4,797,506

6-SUBSTITUTED PROSTAGLANDINS E_1 AND PROCESS FOR PRODUCING SAME

Toshio Tanaka; Atsuo Hazato, both of Hino, and Seizi Kurozumi, Kokubunji, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP85/00096, § 371 Date Oct. 18, 1985, § 102(e) Date Oct. 18, 1985, PCT Pub. No. WO85/03935, PCT Pub. Date Sep. 12, 1985

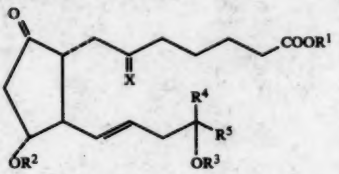
PCT Filed Feb. 28, 1985, Ser. No. 794,857

Claims priority, application Japan, Feb. 29, 1984, 59-36096

Int. Cl.[4] C07D *177/00*

U.S. Cl. 560—121 **4 Claims**

1. 6-Substituted prostaglandins E_1 which are compounds represented by the following formula [I] or their enantiomers or mixtures thereof in any ratio:



wherein

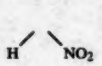
R^1 represents a hydrogen atom, a C_1–C_{10} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted C_3–C_{10} cyloalkyl group, a substituted or unsubstituted phenyl (C_1–C_2) alkyl group, or one equivalent cation;

R^2 and R^3, which may be the same or different, represent a hydrogen atom, a tri (C_1–C_7) hydrocarbon silyl group, or a group forming an acetal linkage together with an oxygen atom of a hydroxyl group;

R^4 represents a hydrogen atom, a methyl group or a vinyl group;

R^5 represents a linear or branched C_3–C_8 alkyl group, a linear or brancehd C_3–C_8 alkenyl group, a linear or branched C_3–C_8 alkynyl group, a phenyl group which is unstubstituted or substituted, a C_3–C_{10} cycloalkyl group which is unsubstituted or substituted, or a linear or branched C_1–C_5 alkyl group which is substituted with a C_1–C_6 alkoxy group, a phenyl group which is unsubstituted or substituted, a phenoxy group which is unsubstituted or substituted, or a C_3–C_{10} cycloalkyl group which is unsubstituted or substituted;

X represents an



group or an oxygen atom, and

said subtituted groups are independently substituted with a C_2–C_7 acyloxy group, a C_1–C_4 alkyl group which is unsubstituted or substituted with a halogen atom, a C_1–C_4 alkoxy group which is unsubstituted or substituted with a halogen atom, a nitrile group, a carboxyl group or a (C_1–C_6) alkoxycarbonyl group.

4,797,507

OUTLET BOX PROVIDED WITH COAXIAL CONNECTORS

Stig-Arne Löfving, Nykköping, Sweden, assignor to Thorsman & Co. Aktiebolag, Stockholm, Sweden

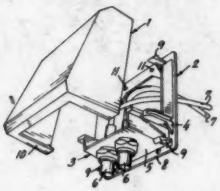
PCT No. PCT/SE86/00235, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/07202, PCT Pub. Date Dec. 4, 1986

PCT Filed May 21, 1986, Ser. No. 25,141

Claims priority, application Sweden, May 23, 1985, 8502563-3

Int. Cl.[4] H01R *13/516*

U.S. Cl. 174—48 12 Claims



1. An outlet box for a coaxial connector, adapted for mounting on a wall, on a conduit channel section or on a recessed junction box in which the coaxial connector is arranged parallel to the underlying support surface, comprising a base plate mountable on a support surface, and a hood-shaped cover detachably mountable on the base plate to protect said plate and any components located thereon, said base plate including a frame having at least one straight edge and a central opening occupying a substantial portion of the base plate for passage of a cable such that when the base plate is fitted on a junction box recessed in a wall the opening in the junction box is substantially exposed to enable the coaxial cable to be bent along a sufficiently large radius in order to minimize damage to the cable, said base plate including two brackets projecting forwardly from said frame and having guide grooves extending substantially at right angles to the base plate, a replaceable connector holder plate slidably mounted in said guide grooves, at least one connector on said holder plate for attachment of said cable thereto, said base plate including means for detachable connection with said hood-like cover, said cover being provided with a recess through which said connector is accessible when the cover is connected to said base plate.

4,797,508

METHOD FOR PRODUCING CIRCUIT BOARDS WITH DEPOSITED METAL PATTERNS AND CIRCUIT BOARDS PRODUCED THEREBY

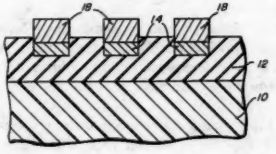
Peter R. Chant, Burlington, Canada, assignor to Firan Corporation, Oakville, Canada

Continuation-in-part of Ser. No. 909,256, Sep. 19, 1986, Pat. No. 4,707,394. This application Aug. 31, 1987, Ser. No. 90,043

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] H05K *1/00;* B32B *3/00;* C23F *1/02;* B29C *37/00*

U.S. Cl. 174—68.5 24 Claims



1. In a process for producing circuit boards having a metallized circuit pattern firmly bonded to a resinous substrate, the steps comprising:

(a) coating a resinous substrate with a fluid mixture of a formualtion containing;

(i) a low molecular weight polyfunctional reactive rubber component comprising an interpolymer of butadiene and acrylonitrile; and

(ii) an epoxy polymer component, said components being interactive at temperatures of at least 180° F., said rubber component comprising 50–200 percent by weight of the epoxy polymer component, said coating having a thickness of 0.0005–0.015 inch;

(b) partially curing the coating to produce partial cross-linking of said epoxy polymer component, further polymerization of the rubber, and interaction of said rubber and epoxy polymer components;

(c) etching the exposed surface of the coating to produce a microporous surface;

(d) depositing metal on the microporous surface of the coating to form a conductive layer with microformations extending into the recesses of said microporous surface;

(e) applying heat and pressure to said conductive layer and coating to fully cure said coating, thereby firmly bonding said coating to said metal layer and thereby said conductive layer through said coating to said resinous substrate; and

(f) electrodepositing metal on said conductive layer to form a conductive pattern therewith, said conductive pattern being bonded firmly to said substrate through said conductive layer and coating.

19. In a circuit board, the combination comprising:

(a) a resinous substrate;

(b) an intermediate coating on one surface of said substrate of about 0.0005–0.015 inch and containing a rubber component and an epoxy polymer which have interacted to provide a matrix of the interacted rubber/epoxy polymer, said rubber component comprising at least 35 percent by weight of said coating; and

(c) a metal conductive pattern on said coating providing a circuit, said conductive pattern having a base metal layer with microformations at the interface with said coating an extending thereinto, said conductive pattern being embedded in said coating to a depth substantially equal to the thickness of said base metal layer, said coating being firmly bonded to said base metal layer and said conductive pattern thereby being bonded through said coating and base metal layer to said substrate.

4,797,509

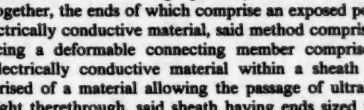
METHOD AND APPARATUS FOR CONNECTING ELECTRICAL CONDUCTORS TOGETHER

Jeffrey A. Cook, Sherwood, Oreg., assignor to Nicor, Inc., Tualatin, Oreg.

Filed Nov. 19, 1987, Ser. No. 122,748

Int. Cl.[4] H02G *15/08;* H01R *43/04, 4/20*

U.S. Cl. 174—84 C 22 Claims



9. A method for connecting a plurality of electrical conductors together, the ends of which comprise an exposed portion of electrically conductive material, said method comprising:

placing a deformable connecting member comprised of electrically conductive material within a sheath comprised of a material allowing the passage of ultraviolet light therethrough, said sheath having ends sized to receive said conductors, a diameter greater than that of said

connecting member, and a length greater than that of said connecting member;

inserting a portion of ultraviolet-curable adhesive within each end of said sheath; and

sealing each end of said sheath so as to retain said adhesive therein until the connection of said conductors is desired.

4,797,510

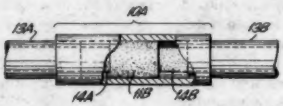
DEVICE FOR JOINING SUPERCONDUCTING WIRE

John L. Mihelich, Ann Arbor, Mich., assignor to Amax, Inc., New York, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,077

Int. Cl.[4] H01R *4/68*

U.S. Cl. 174—94 R **8 Claims**



1. A coupling device for joining together at least a pair of superconducting cored wires, the core of each wire consisting essentially of a substantially unitary structure of a sintered superconducting material, each core being confined within a tubular element of a metal having an electrical conductivity of at least about 20% of that for pure copper taken as unity, said metal forming a cladding around each core, said coupling device comprising:

a tubular segment of the same clad metal as said superconducting cored wires,

said tubular segment having an internal diameter (I.D.) corresponding substantially to the outside diameter (O.D.) of said cored wires sufficient for receiving an exposed end core portion of said uperconducting cored wire and providing an interference fit with the O.D. thereof,

said tubular segment having disposed therein a green pellet of the same material as said superconducting material, and

said pellet being positioned inwardly from both ends of said tubular element to allow for entry at each end thereof of an exposed end portion of a superconducting cored wire to be joined and thereby provide a coupling therefor.

4,797,511

POLYETHYLENE STABILIZED BY MIXTURE OF HINDERED PHENOL AND AMINE ANTIOXIDANTS

Janet D. Capolupo, Watertown, and Thomas M. Chucta, Naugatuck, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Sep. 25, 1987, Ser. No. 101,318

Int. Cl.[4] C08K *5/36*

U.S. Cl. 174—110 PM **7 Claims**

1. A composition stabilized against oxidative degradation comprising:

(a) a non-cross-linked polyolefin;

(b) 0.1 to 20 weight percent carbon black homogeneously incorporated in said polyolefin;

(c) an effective amount of thiodiethylene bis(3,5 di-t-butyl-4-hydroxy)hydrocinnamate incorporated into said polyolefin; and

(d) an amine antioxidant based on quinoline selected from the group consisting of polymerized quinoline, 6-dodecyl-2,2,4-trimethyl-1,2-dithydroquinoline and 6 ethyoxy-2,2,4-trimethyl-1,2-dihydroquinoline, wherein thiodiethylene bis(3,5 di-t-butyl-4-hydroxy) hydrocinnamate and said amine antioxidant constitute a combined weight percent of about 0.05 to about 3.0.

4,797,512

BRANCH WIRE PROTECTOR

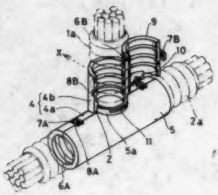
Fumio Kumagai, and Toshio Okazaki, both of Toyota, Japan, assignors to Yazaki Corporation, Japan

Filed Dec. 24, 1987, Ser. No. 137,662

Claims priority, application Japan, Dec. 25, 1986, 61-198255[U]

Int. Cl.[4] H02G *3/02*

U.S. Cl. 174—135 **5 Claims**



1. A branch wire protector comprising:

(a) a T-shaped semicylindrical member having a trunk portion and a branch portion;

(b) a trunk semicylindrical member openably joined to the trunk portion of said T-shaped semicylindrical member and having a semicylindrical base portion near a junction point of the trunk portion and the branch portions;

(c) a branch semicylindrical member openably joined to the branch portion of said T-shaped semicylindrical member;

(d) locking members for locking said trunk semicylindrical member and said branch semicylindrical member to said T-shaped semicylindrical member; and

(e) means for clinching said branch semicylindrical member to said trunk semicylindrical member near the junction point of the trunk portion and the branch portion of said T-shaped semicylindrical member.

4,797,513

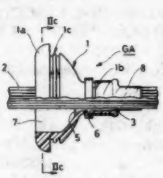
GROMMET WITH WIRES SEALED THERETO AND METHOD OF FORMING SAME

Mamoru Ono; Kohji Naruse, and Toshio Okazaki, all of Aichi, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 25, 1987, Ser. No. 125,583

Int. Cl.[4] H01B *17/30*; H02G *3/22*

U.S. Cl. 174—153 G **5 Claims**



1. An assembly of a grommet and wires extending therethrough, comprising:

(a) an elastic funnel-shaped grommet body having a large-diameter cylindrical portion formed with an outer circumferential annular groove fittable to a hole of a panel and a small-diameter cylindrical portion through which the wires are passed; and

(b) a penetrating and waterproof sealing material filling a space between the small-diameter cylindrical portion and the wires and gaps among wires passed through the small-diameter portion of the grommet.

5. A method of sealing wires to a grommet fittable to a panel

to guide the wires passing through the panel, which comprises the following steps of:

(a) passing wires through a large-diameter cylindrical portion and a small-diameter cylindrical portion of a grommet;

(b) positioning the grommet at a determined position on the wires;

(c) temporarily fixing the wires to the grommet by taping a border between the small diameter cylindrical portion and the wires;

(d) standing up the grommet so that the larger diameter cylindrical portion faces upward;

(e) putting a sealing material from above the grommet to fill a space between the small-diameter cylindrical portion and the wires and gaps among the wires; and

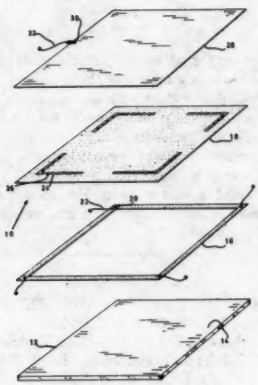
(f) hardening the sealing material before fitting the grommet to a hole of the panel.

4,797,514

TOUCH SENSITIVE DEVICE WITH INCREASED LINEARITY

John E. Talmage, Jr., Anderson County, and William A. Gibson, Knox County, both of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Filed Jun. 9, 1986, Ser. No. 871,991
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **19 Claims**



1. A position touch sensor which provides a linear output response over an enhanced proportion of the surface area of said sensor by reducing the bow of equipotential lines along edges of said sensor, which comprises:

a resistive layer having a selected substantially uniform resistivity throughout said layer, said layer defining perimeter edges joined at corners;

a resistance element positioned proximate each of said perimeter edges of said resistive layer for providing orthogonal electrical fields to said resistive layer, each of said resistance elements having opposite ends joined to proximate ends of adjoining resistance elements, each of said resistance elements being in electrical contact with said resistive layer;

a plurality of discontinuous insulator regions of selected effective lengths in said resistive layer arranged along a selected path proximate said resistance elements in a direction toward said area of linear output, and defining spaces of selected effective lengths and width between adjacent of said insulator regions, said resistivity of said resistive layer producing in said spaces resistor electrode elements having selected values of resistance, said selected effective lengths of said insulator regions and said selective resistance values of said resistor electrode elements being selected to produce a selected voltage gradient along said path to compensate for any voltage drop along said resistance element when said orthogonal fields are introduced into said resistive layer through said resistor electrode elements whereby said bow is reduced; and

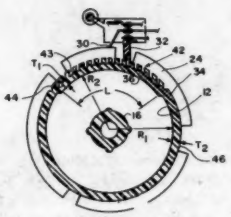
means for deriving output signals corresponding to coordinates of a selected point on said resistive layer within said area of linear output.

4,797,515

SWITCH TIMING MECHANISM WITH SERRATED CAMSTACK

Henry E. Burgin, Greenwood, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 100,729, Sep. 25, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 205,551
Int. Cl.[4] H01H *43/10*
U.S. Cl. 200—38 R **6 Claims**



1. A timing mechanism comprising:

a motor;

a camstack coupled to said motor, said camstack including: (a) a hub having an outer hub surface and an inner hub surface, said inner hub surface having a first inside radius and an arc segment of said inner surface having a second inside radius smaller than said first inside radius; and (b) cam means carried on said hub for providing a cam surface;

a switch comprising: (a) at least one switch blade; (b) referencing means for referencing said blade to said hub, said referencing means including a hub follower riding on said hub surface; and (c) a cam follower riding on said cam surface; and

wherein a section of said hub directly underneath the area where said hub follower rides and above said arc segment has material removed therefrom.

4,797,516

MOLDINGS FOR ISOLATION SWITCH AND FUSE CLIPS

Michael R. Clark; Gerald J. Kuiper, both of Columbia; Donald B. Monson, Eastover, and Dominick Tringali, Columbia, all of S.C., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 754,873, Jul. 12, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 18,767
Int. Cl.[4] H01R *13/70*
U.S. Cl. 200—51 R **12 Claims**

1. An improved electrical switch apparatus having:

a first molding means for supporting an isolation switch and for supporting at least one line side power fuse clip, and at least one line side power fuse clip capable of retaining a first end of a power fuse fed by said isolation switch;

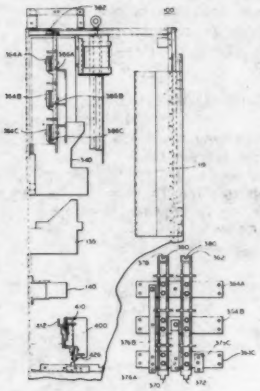
a second molding means for supporting at least one load side power fuse clip, said at least one load side power fuse clip capable of retaining a second end of said power fuse;

wherein the improvement comprises:

at least one projection formed into said second molding means supporting a control circuit fuse, said at least one

projection being substantially parallel to and beside a power fuse when a power fuse is installed in said apparatus;

a control circuit line side fuse clip and a corresponding



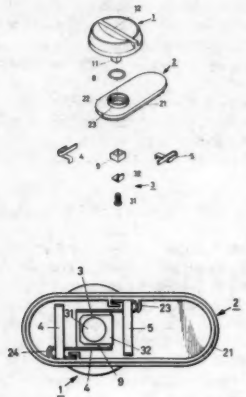
control circuit load side fuse clip mounted to each said projection formed into said second molding means, so that a control fuse and a power fuse are spaced apart and substantially parallel when both are installed in the apparatus.

4,797,517

SWITCH DEVICE OF PORTABLE FLASHLIGHT

Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan

Filed Sep. 18, 1987, Ser. No. 98,149
Int. Cl.[4] F21V *23/04*
U.S. Cl. 200—60 **4 Claims**



1. A switch device of a portable flashlight having a casing, built-in casing for housing bulbs, and a lighting circuit connected to said bulbs, and a rotatable switch mounted on said casing for turning on and off said casing for turning on and off said lighting circuit, comprising:

means for operating said rotatable switch;

a turnable contact means coupled to said operating means on said axis of said rotatable switch;

a base-board;

at least two contact means installed on said base-board on opposing sides of said axis and directly on opposing sides of said turnable contact means for selectively detachably engaging said turnable contact means, and

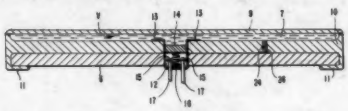
wherein said casing has a recess portion to receive said base-board and has a hole through which said lighting circuit is connected with said turnable contact means and said at least two contact means.

4,797,518

BRAKING INDICATOR

Stephen D. Ambrose, 2 Washington St., Rocky Hill, N.J. 08553; Jeffrey W. Tunkel, 4667 Willow Grove Dr., Ellicott City, Md. 21043, and Joseph F. Shelley, 54 Talbot La., Princeton, N.J. 08540

Filed Nov. 30, 1987, Ser. No. 126,571
Int. Cl.[4] H01H *3/14, 35/24;* B60Q *1/00*
U.S. Cl. 200—61.89 **14 Claims**



1. An apparatus for indicating vehicle braking, comprising:

a means for actuating brakes of the vehicle;

a flexible member located on the actuating means to be directly contacted by the driver of the vehicle when it is desired to brake the vehicle, such member being deformable in response to direct contact with the member by the driver of the vehicle; and

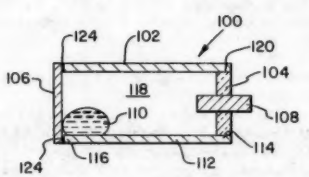
a fluid pressure actuated switching means responsive to deformation of the member for energizing a braking indicator on the vehicle.

4,797,519

MERCURY TILT SWITCH AND METHOD OF MANUFACTURE

George H. Elenbaas, 25526 N. Shore Dr., Elkhart, Ind. 46514

Filed Apr. 17, 1987, Ser. No. 40,213
Int. Cl.[4] H01H *29/04*
U.S. Cl. 200—226 **15 Claims**



1. A mercury tilt switch comprising:

a hollow housing having opposite open ends;

an insulating member disposed at, making a compression seal with, in direct contact with, and closing, one of said open ends of said housing,

an end cap disposed at, making a seal with, and closing, the other of said open ends of said housing;

said housing defining a single chamber therewithin between said insulating member at said one housing end and said end cap at said other housing end;

at least one electrical electrode sealably mounted through

and in direct contact with said insulating member and projecting from opposite sides thereof to outside of and into said housing chamber; and

a quantity of mercury disposed in said single housing chamber and flowable between and contactable with said electrode at said one housing end and with said end cap at said other housing end upon tilting and countertilting of said housing.

4,797,520

SWITCH, ESPECIALLY FOR MOTOR VEHICLES

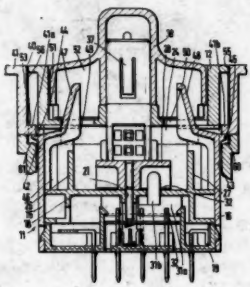
Hubert Spazierer, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Continuation of Ser. No. 907,448, Sep. 15, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 110,629

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533055

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—295 **14 Claims**



1. A switch assembly comprising:

a housing inserted into an opening of a mounting plate, said housing

comprising several side walls, a base plate and a front plate formed with an aperture, said housing containing switch means, said front plate bearing on an exterior surface of said mounting plate;

a locking spring projecting laterally from at least one of said side walls for snapping behind said mounting plate when said switch assembly is inserted in the mounting plate and retaining said housing in said mounting plate; and

a release shank projecting from said locking spring into the housing interior and ending adjacent said aperture in said front plate for moving said locking spring to a position where said housing can be removed from said mounting plate.

4,797,521

MICROWAVE OVEN COOKWARE PEDESTAL

Henrietta M. Liwski, Rte. 1, Box 365, Readville, Va. 22539

Filed Nov. 4, 1987, Ser. No. 116,355

Int. Cl.[4] H05B *6/80*

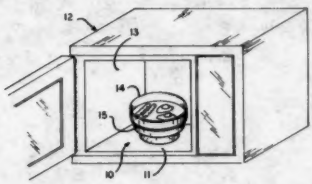
U.S. Cl. 219—10.55 E **2 Claims**

1. A pedestal adapted for use in a microwave oven cooking chamber for supporting cookware having a metallic coating on its bottom and wherein the coating occupies the central area of the cookware bottom and leaving an outer bottom perimeter free of the coating, comprising:

a pair of pan-shaped dished having bottom walls joined to one another to define a unitary member,

each said dish provided with a rim defining a horizontal planar cookware supporting surface vertically spaced from the respective said bottom wall,

said rims of said two dishes defining two different diameters, and



said pedestal constructed of plastics material devoid of reflective or absorbent coatings and substantially inert to the effects of microwave radiation, whereby

said pedestal may be selectively inverted prior to placing within the chamber of a microwave oven to utilize either diameter rim for supporting the outer bottom perimeter of cookware at an elevated position within the oven with the cookware coating disposed in an isolated manner within the confines of said dish rim.

4,797,522

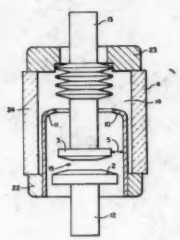
VACUUM-TYPE CIRCUIT INTERRUPTER

Roy E. Voshall, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1988, Ser. No. 165,067

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **4 Claims**



1. A vacuum circuit interrupter comprising

(a) an insulated cylindrical evacuated housing;

(b) a stationary electrode in said housing;

(c) a movable electrode in said housing adapted to engage said stationary electrode so as to provide an arc on separation;

(d) an arc shield surrounding the stationary electrode and electrically connected thereto extending toward the movable electrode to provide a predetermined spacing between the arc shield and the movable electrode; and

(e) in which the movable electrode is of a smaller dimension with respect to the stationary electrode so as to form asymmetric shaped electrode structures, whereby to provide the predetermined spacing between the arc shield and the movable electrode.

4,797,523

COVER FOR AN OPEN CONTAINER, WHOSE CONTENT IS TO BE HEATED IN A MICROWAVE OVEN

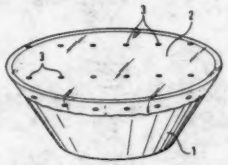
Friederun Kohnen, Untere Heide 6a, 4322 Sprockhovel, Fed. Rep. of Germany

Filed Aug. 19, 1986, Ser. No. 897,998

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530008

Int. Cl.[4] H05B 6/80; B65D 65/02

U.S. Cl. 219—10.55 E 8 Claims



1. A cover for an open container in which material therein is to be heated in a microwave oven, characterized in that the cover is made from a cellulose hydrate film including means defining ventilation holes therein.

4,797,524

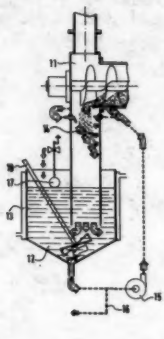
APPARATUS AND METHOD FOR REGENERATING ACTIVE CARBON

Jacques Moret, Saint Pardoux; Jean-Maurice Fosset, Nantiat; Jacques Couturier, Razes, and Noël Viard, Bessines, all of France, assignors to Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

Filed May 20, 1986, Ser. No. 864,918

Int. Cl.[4] H05B 6/10

U.S. Cl. 219—10.69 27 Claims



1. In an apparatus for regenerating a particulate material which includes (a) an enclosed reactor having an input end and an output end; (b) means for introducing said material, to be regenerated, into said input end of said reactor; said material introducing means being in air-tight communication with said input end; (c) a shaft with blades or a first Archimedes screw within said reactor and extending continuously between said input and output ends of said reactor to transport said material all the way from said input end to said output end; and (d) means for substantially uniformly heating the inside of said reactor and thereby heating said material to regenerate said material and form gaseous byproducts; the improvement which comprises:

(e) means for providing an atmosphere inside said reactor that: (i) contains steam, (ii) is saturated with water vapor and (iii) is close to atmospheric pressure; and

(f) means in communication with said output end for: (i) evacuating said gaseous byproducts, (ii) condensing steam from said reactor, (iii) trapping particles of said material in said gaseous byproducts and steam from said reactor; and (iv) transporting said material from said output end; said means (f) for evacuating, condensing, trapping and transporting providing a relatively reduced pressure at said output end which causes steam, inside said reactor, to circulate cocurrently with said material as it is transported through said reactor.

4,797,525

INDUCTION HEATER FOR FLOATING ZONE MELTING

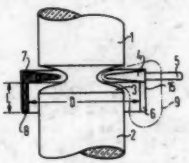
Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1987, Ser. No. 76,254

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625669

Int. Cl.[4] H05B 6/40

U.S. Cl. 219—10.79 4 Claims



1. An induction heater for flating zone melting of a crystalline semiconductor rod, the induction heater comprising: a flat coil and a cylindrical supplementary heater arranged coaxially with the flat coil and connected to the coil; the supplementary heater being of an electrically conductive metal and electrically connected parallel with the flat coil; the supplementary heater being arranged exclusively on one side of the flat coil the supplementary heater having two metal rings and axial metal rods extending between the two metal rings to form a cylindrical cage, and each metal ring having a radial slot, the radial slot of one metal ring axially with the radial slot of the other ring, and the flat coil having a single turn defining an opening and two terminals having a slot between them aligned with the radial slots.

4,797,526

METHOD FOR WIRE-CUT ELECTRIC DISCHARGE MACHINING UTILIZING ADJOINING SEGMENTS OF A COMMON ELECTRODE

Inoue Kiyoshi, Tokyo, Japan, assignor to Inoue Japax Research Incorporated, Tokyo, Japan

PCT No. PCT/JP86/00018, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04279, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 17, 1986, Ser. No. 919,249

Claims priority, application Japan, Jan. 18, 1985, 60-05943; Feb. 8, 1985, 60-21793; Apr. 11, 1985, 60-75361; Apr. 16, 1986, 60-79400

Int. Cl.[4] B23H 7/02, 7/10

U.S. Cl. 219—69 W 10 Claims

1. In a method of performing wire-cut electric discharge machining using a wire electrode which is pulled off a supply reel, passes along a predetermined path, machines a work piece, and is collected by a collecting apparatus, the improvement comprising the steps of:

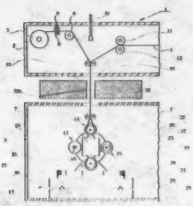
allowing a first segment of said wire electrode to pass through a working portion of said work piece;

turning back the wire electrode for return along the path it has come;

allowing a return segment of the wire electrode to pass

through the working portion of the work piece again in adjoining relation to the first segment;

then collecting the wire electrode by engaging said return segment; and



simultaneously machining the work piece by reciprocating said two segments of the wire electrode while feeding said segments along a common cutting line through the working portion of the work piece.

4,797,527

ELECTRODE FOR ELECTRIC DISCHARGE MACHINING AND METHOD FOR PRODUCING THE SAME

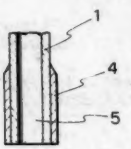
Kenji Yamamoto; Takehisa Nakayama, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1986, Ser. No. 825,288

Claims priority, application Japan, Feb. 6, 1985, 60-21403; Nov. 5, 1985, 60-247464

Int. Cl.⁴ B23H *1/04*; B05D *3/06*

U.S. Cl. 219—69 E **15 Claims**



6. An electric discharge machining electrode comprising a conductive core; a buffer material coated thereon, selected from the group consisting of metals having a small thermal expansion coefficient and amorphous material; and a hard insulator having a surface Vickers hardness of not less than 1000 coated on the buffer material.

4,797,528

VACUUM CARBON ARC METAL REMOVAL PROCESS AND APPARATUS

Paul E. Moore, Glouster; Jeffrey S. Henderson, Lancaster; Lawrence R. Soisson, Hide-A-Way Hills, and Andrew J. Toth, Copley, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Dec. 8, 1987, Ser. No. 130,016

Int. Cl.⁴ B23K *9/32*; A47L *5/00*

U.S. Cl. 219—70 **8 Claims**

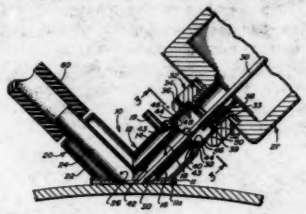
1. A method for cutting or gouging a metallic workpiece comprising the steps of:

(a) providing an electrode and means for striking and maintaining an arc between said electrode and said workpiece;

(b) isolating a portion of the electrode and the related arc struck between the electrode and said workpiece and the atmosphere surrounding said arc and said workpiece;

(c) injecting water into said isolated atmosphere surrounding said arc and

(d) subjecting said isolated portion to the effect of a vacuum to continuously evacuate said atmosphere surrounding said arc and said workpiece, said atmosphere containing molten metal and air drawn from outside said isolated portion while moving said electrode in a direction to produce the desired cut or gouge in said workpiece.



4,797,529

STUD WELDING APPARATUS

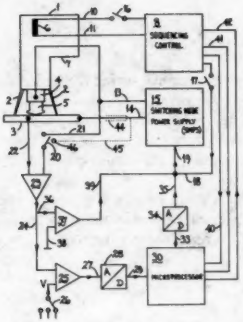
Klaus G. Schmitt, Giessen, and Wolfgang Schmidt, Reiskirchen, both of Fed. Rep. of Germany, assignors to Emhart Enterprises Corp., Farmington, Conn.

Continuation of Ser. No. 036,046, Apr. 8, 1987, abandoned. This application May 23, 1988, Ser. No. 203,535

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611823

Int. Cl.⁴ B23K *9/20*

U.S. Cl. 219—99 **25 Claims**



1. An apparatus for arc welding a stud onto the surface of a workpiece which comprises:

means for gripping said stud;

means for initially positioning said stud adjacent said surface;

means for effecting a return stroke to bring said stud away from said surface;

means for igniting a pre-current arc during said return stroke;

means for initially setting the magnitude of said pre-current arc;

means for initially setting the time duration of said pre-current arc;

means for effecting a forward stroke;

means for igniting a main welding arc during said forward stroke;

means for initially setting the magnitude of said main welding arc;

means for initially setting the time duration of said main welding arc;

means for sensing the voltage of said pre-current arc;

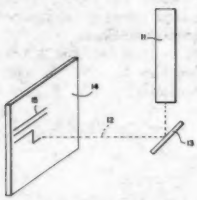
means for comparing the voltage of said pre-current arc to a desired value to determine a correction voltage;
means for sensing said correction voltage;
means for changing the time duration of said pre-current arc responsive to said correction voltage;
means for changing the magnitude of said pre-current arc responsive to said correction voltage;
means for changing the magnitude of said main welding arc responsive to said correction voltage; and
means for changing the time duration of said main welding arc responsive to said correction voltage.

4,797,530

CERAMIC CIRCUIT SUBSTRATES AND METHODS OF MANUFACTURING SAME

Nobuo Iwase, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 10, 1986, Ser. No. 939,969
Claims priority, application Japan, Dec. 11, 1985, 60-278154
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.85 **44 Claims**



1. A method of manufacturing ceramic circuit substrate, comprising the steps of:
(i) providing an electrically insulating ceramic substrate that is comprised of at least one material selected from the group consisting of aluminum nitride and silicon nitride; and
(ii) irradiating a predetermined region of said ceramic substrate with an energy beam such that at least a portion of said region is rendered conductive.

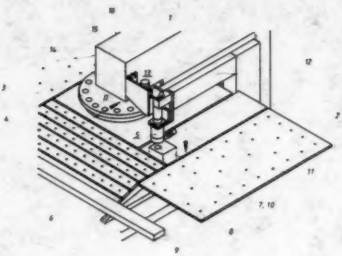
4,797,531

CUTTING PRESS

Gerhard Otto, Alfeld; Manfred Rohrbach, Hildesheim, and Gerald Leupold, Alfeld, all of Fed. Rep. of Germany, assignors to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,528
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637204
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.67 **32 Claims**

1. A cutting press for working plate-shaped workpieces, comprising at least one working station in which a workpiece having a working plane is supported and in which a part of the workpiece is to be cut out; means for cutting out the part of the workpiece; and means for releasing the cutout part of the workpiece from the plane of the workpiece for removing the cutout part from said working station, said releasing means including substantially a structural element which is movable in a working region of said working station in a motorized manner, and shaped to release the cutout part from the workpiece, said structural element being an extracting plate which is shaped for displacing the cutout part from the plane of the workpiece, said extracting plate having a side which is arranged to face the cutout part of the workpiece and is provided



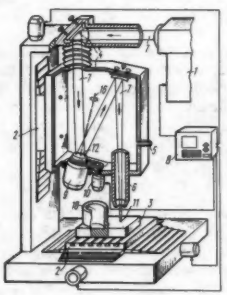
at said side with a plurality of displacement bodies composed of an elastic material.

4,797,532

APPARATUS FOR LASER TREATMENT OF MATERIALS

Vladimir S. Maiorov, Dokuchaev pereulok, 15, kv. 42, Moscow, U.S.S.R.

PCT No. PCT/SU86/00025, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987, PCT Pub. No. WO87/05843, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 26, 1986, Ser. No. 156,918
Int. Cl.[4] B23K *26/06*
U.S. Cl. 219—121.74 **5 Claims**



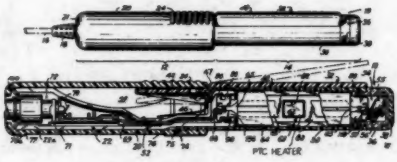
1. An apparatus for laser treatment of materials, comprising a laser (1), a coordinate table (2) on which a material (3) to be treated is placed, a system (4) for delivery, transformation and focusing of laser radiation, equipped with an outlet barrel (6), arranged along the path of a laser beam (7), and provided with a numerical control system (8) connected to the laser (1) and the coordinate table (2), characterized in that the laser radiation delivery, transformation and focusing system (4) comprises a mirror optical unit (9) provided with a drive (10) for rotation about the axis (16) thereof and connected to the numerical control system (8).

4,797,533

ELECTRIC HAIR APPLIANCE HAVING AN IMPROVED HANDLE AND ACTUATING MECHANISM CONSTRUCTION

Daniel Santhouse, Stratford, and Kevin E. Reeves, Trumbull, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Nov. 7, 1986, Ser. No. 929,023
Int. Cl.[4] H05B 3/00; A45D 1/04, 2/36
U.S. Cl. 219—225 11 Claims



1. In a hair appliance having a cylindrical handle, an elongated hair winding portion connected to an end of said handle and having at least a part thereof movable relative to said handle and said hair winding portion, an actuating mechanism for enabling movement of said movable part, said actuating mechanism including a movable surface, said hair appliance further having a bias means for biasing said actuating mechanism to a predetermined position, the improvement comprising:

said handle having a cylindrical external surface at a predetermined radial distance from the longitudinal axis of said handle, said surface being indented over a predetermined longitudinal length and predetermined arcuate extent to form a recess in said external surface,

said actuating mechanism having said movable surface thereof overlying said recess and substantially aligned at said predetermined radial distance with the cylindrical external surface of said handle when said actuating mechanism is biased to said predetermined position, said movable surface being radially inwardly movable relative to said handle and adapted to be received, upon radially inward movement thereof, in said recess, and

a cylindrical flexible sleeve member covering a predetermined portion of said recess and said handle and at least part of said movable surface of said actuating mechanism, that part of said sleeve member covering said movable surface of said actuating mechanism being adapted to be flexed radially inwardly to move said actuating mechanism against said bias means and into said recess within said external surface of said handle, said recess being sufficiently large to enable said flexible sleeve member to be deformed inwardly a sufficient amount to enable adequate radially inward movement of said actuating mechanism without unduly stressing sad sleeve.

4,797,534

PTC THERMISTOR HEATING DEVICE

Lee A. Prager, Raymond, and Mason Ide, Gorham, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1987, Ser. No. 59,291
Int. Cl.[4] H05B 3/78; F24H 1/20; F28D 15/00
U.S. Cl. 219—326 12 Claims

1. A heater adapted to be disposed in a vessel thereby to heat liquids contained therein, said heater comprising:

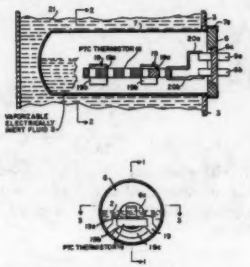
a sealed heat-transmitting cannister;

a PTC thermistor disposed within said cannister and electrically insulated therefrom;

means to convey current to opposite sides of said PTC thermistor;

at least one brace disposed in said cannister;

each said brace including a pair of channels which face each other and engage the edges of said PTC thermistor; and



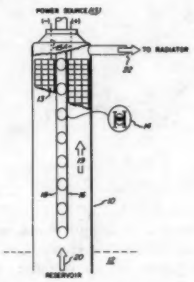
a partial fill of electrically inert fluid disposed in said cannister.

4,797,535

TUNGSTEN-HALOGEN HEATER

Wayne A. Martin, P.O. Box 147, West Lebanon, N.Y. 12195

Filed Nov. 30, 1987, Ser. No. 126,786
Int. Cl.[4] F24H 3/00; H05B 1/008
U.S. Cl. 219—338 10 Claims



1. A heater comprising:

conduit means for liquidic fluid flow having defined therein fluid ingress and egress ports;

physical and electrical means within said conduit for attachment and operation of at least a singular tungsten-halogen heating element therein; and

at least one tungsten-halogen heating element attached to said electrical means.

4,797,536

TEMPERATURE CONTROL APPARATUS FOR A WATERBED

Jerome D. Handley, Palmdale, Calif., assignor to Electrofilm, Inc., Valencia, Calif.

Filed Mar. 31, 1986, Ser. No. 846,368
Int. Cl.[4] H05B 1/02
U.S. Cl. 219—494 6 Claims

1. An apparatus for controlling the temperature of the water in a waterbed in preventing localized overheating during use, said apparatus comprising: a substantially flat heater means for heating the water in the waterbed; a substantially flat thermally conductive plate adjacent to and in thermal contact with said heater means; a thermally conductive member disposed in thermal contact with said plate and defining holding means outwardly spaced from said plate, temperature sensing means

carried by said holding means in thermal contact with said thermally conductive member for sensing the temperature of said member; and temperature control means in operative

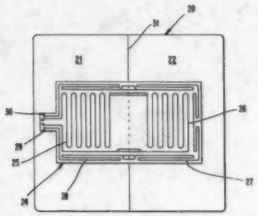
communication with said temperature sensing means and said heater means for activating and deactivating said heater means in response to variations in the temperature of said thermally conductive member.

4,797,537

FOIL ELEMENT

Rolf Berthelius, Västerås, and Tommy Fredriksson, Hallstahammar, both of Sweden, assignors to Kanthal AB, Hallstahammar, Sweden

Filed Dec. 10, 1986, Ser. No. 939,968
Claims priority, application Sweden, Dec. 13, 1985, 8505911
Int. Cl.[4] H05B 3/34
U.S. Cl. 219—528 **5 Claims**



1. Heating apparatus for heating a planar surface, including an electric resistance foil heating element, said element comprising at least two plastic foils, a metallic electric resistance heating coil disposed between said foils and occupying a substantial portion of the area of the element surface to heat objects placed against the surface of the element, a metallic sensor coil formed of the same metallic material and of the same thickness as said heating coil and situated beside said heating coil between said foils at a distance from said heating coil and in coplanar relationship therewith, said sensor coil occupying a smaller portion of the area of the element surface than said heating coil, said sensor coil being electrically isolated from said heating coil and spaced sufficiently far from said heating coil that said sensor coil is heated primarily by heat conducted through said foils and is heated to a smaller extent by direct heat from said resistance coil, whereby the temperature of said sensor coil is determined substantially by the heat traveling to or from the object being heated.

4,797,538

CALCULATOR —HORN BUTTON

David E. Schick, 1000 E. Oak St., Lamar, Colo. 81052

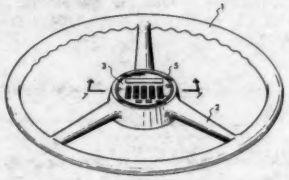
Filed Sep. 8, 1987, Ser. No. 93,960
Int. Cl.[4] G06C 5/02; H01H 9/00
U.S. Cl. 235—1 D **13 Claims**

1. In combination;

a motor vehicle steering wheel having means connecting an outer circumferential rim portion of said wheel with a center portion of said wheel,

a calculator including keys on a top side of said calculator for performing user specified calculations when selected ones of said keys are depressed by a pressure less than a predetermined amount,

securing means for affixing said calculator to said center portion of said wheel so that said calculator can also function as a horn circuit activating means for said vehicle,



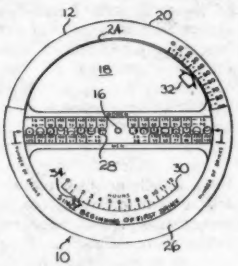
and means affixed to a back side of said calculator for activating a horn circuit of said vehicle when a pressure greater than said predetermined amount is exerted on said keys on said top side of said calculator.

4,797,539

ALCOHOLIC CONCENTRATION INDICATOR

Guy A. Forest, 942, Nicole-Lemaire, Boucherville, Qc, Canada J4B 3G5

Filed Jun. 10, 1987, Ser. No. 60,236
Int. Cl.[4] G06C 3/00
U.S. Cl. 235—85 R **6 Claims**

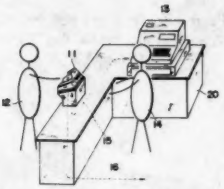


1. An alcoholic concentration indicator comprising at least two superposed concentric circular discs adapted to rotate about their axis relative to one another, the lower one having on, at least part of its peripheral margin, a scale representing alcohol concentration indicia and a multiplicity of numbers concentrically displayed inside said margin, the said numbers representing the number of drinks consumed, the second disc having a dimension adapted to cover the portion of said lower disc inside said margin and being provided with an elongated slot across a diameter of said second disc, the width of said slot corresponding substantially to the size of the said numbers displayed on the lower disc, the said second disc displaying along the edges of said slot a series of figures representing the weight of human bodies and also displaying a series of numbers along a circumferential portion thereof, the said series of numbers representing the number of hours elapsed since the beginning of the first drink, means rotating about the axis of said superposed discs for the double and simultaneous identification of a number of said series of numbers and a portion of said scale, whereby the said discs are rotated relative to one another to match one of said figures representing a weight with one of said numbers on the lower disc appearing through said slot, the said means being rotated to identify simultaneously a number in said series of numbers and an alcohol concentration indicium on said scale.

4,797,540
PAYMENT MAKING TERMINAL DEVICE

Ryuichi Kimizu, Ootsu, Japan, assignor to Omron Tateisi Electronics Co., Tyoto, Japan

Filed Nov. 5, 1987, Ser. No. 116,778
Claims priority, application Japan, Nov. 6, 1986, 61-264328
Int. Cl.[4] G06K 15/00
U.S. Cl. 235—383 3 Claims



1. A payment making terminal device electrically connected to a registration processing device, for making payment when an operator enters data related to commodities purchased by a customer to the registration processing device and then the customer operates keys of the payment making terminal device, which comprises:

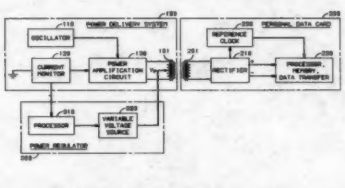
first displaying means, disposed on a front surface of the device so as to display to the customer, operation guidance for the customer and

second displaying means, disposed on a rear surface of the device so as to display to the operator, the operation guidance.

4,797,541
POWER REGULATOR FOR A CONTACTLESS CREDIT CARD SYSTEM

Robert L. Billings, Andover, Mass.; Mark A. Bowers, Woodburn, and Frankie G. Meier, Indianapolis, both of Ind., assignors to American Telephone and Telegraph Company—AT&T Information Systems, Holmdel, N.J.

Filed Apr. 14, 1986, Ser. No. 851,849
Int. Cl.[4] G06K 7/08, 19/06
U.S. Cl. 235—449 12 Claims



1. In a receptor for a computerized transaction card containing microcomputer means, a power transfer coil, and a power transfer ferromagnetic member adapted, when said card is in said receptor, to flux link said coil with a transformer primary means in said receptor for transfer of energy from said receptor to said microcomputer means to provide therefor both operating power and a clock signal transmitted to said coil from said receptor, an improvement comprising:

a power amplification circuit adapted to drive the transformed primary means in response to an oscillator signal of predetermined frequency, the transformer primary means being connected to a variable voltage source;

means for measuring current flow in the transformer primary and for providing an output signal (I_a) representing an averaged magnitude of same; said microcomputer means being responsve to values of P_{thresh}, I_q, V_n and C.F., stored in memory means, for performing the calculations;

$$P_{card}=(I_a-I_q)\times V_n\times C.F.$$

where:

I_q=quiescent current flow in the transformer primary

V_n=magnitude of voltage source

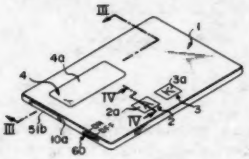
C.F.=correction factor

P_{thresh}=threshold power level for the transaction card and increasing said variable voltage source until P_{card} exceeds P_{thresh}.

4,797,542
MULTIPLE APPLICATION ELECTRONIC CARD-LIKE APPARATUS

Kazuya Hara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,343
Claims priority, application Japan, Feb. 4, 1986, 61-22538
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 21 Claims



1. A multiple application card-like electronic apparatus, comprising:

electronic component means for performing predetermined electrical functions, including:

circuit board means having a plurality of external terminals for connecting to an external device,

input terminal means for receiving an input signal,

memory means for storing application data,

application designation means for selecting application data stored in said memory means according to an input signal received through said input terminal means, and

indication means for indicating application selected by said application designation means; and

cover means for covering said electronic component means, said cover means having an outer surface defining a substantially flat plane and an opening in said outer surface for exposing said external terminals to the outside of said card-like electronic apparatus.

4,797,543
SELECTABLE DATA READOUT IC CARD

Hiroshi Watanabe, Kokubunji, Japan, assignor to 501 Toppan Moore Company, Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 892,099
Claims priority, application Japan, Jul. 31, 1985, 60-169237
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—492 11 Claims

1. An IC card containing an electronic circuit including at least a CPU and memory means in which a plurality of storage areas are allocated, wherein information can be written sequentially in said memory means and said information can be read from said memory means, comprising:

means for receiving an external indicator at the IC card;

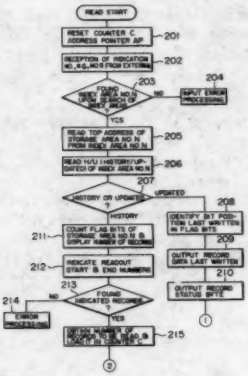
means for generating a signal at the IC card in response to the external indicator;

means for selectively indicating in response to said signal that information recorded in a plurality of storage areas of the memory means is either updated information or history information;

means for reading updated information, including only information recently stored in said storage areas, when said

indicating means indicates that the information written in said storage areas is updated information; and

means for reading history information, including the information stored in said storage areas, in a predetermined sequential order when said indicating means indicates that the information written in said storage areas is history information.



4,797,544

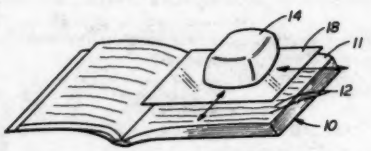
OPTICAL SCANNER INCLUDING POSITION SENSORS

James R. Montgomery, 211 Durham St., Menlo Park, Calif. 94025; John A. Figueroa, P.O. Box 160, Mountain View, Calif. 94042, and George White, 25785 Bassett La., Los Altos Hills, Calif. 94022

Filed Jul. 23, 1986, Ser. No. 889,130

Int. Cl.[4] G01V 9/04

U.S. Cl. 250—221 **4 Claims**



2. Apparatus for scanning a surface displaying information, said apparatus comprising:

a transparency including optically detectable indicia of location and adapted to cover, and to extend said indicia over siad information on, at least a portion of said surface; and

an image scanner adapted to be moved across said transparency in any selected direction parallel to said surface and including

at least one photosensitive element for sensing light emanating from said surface through said transparency and for developing information signals corresponding to said information, and

means including first and second detectors for optically detecting said indicai of location and, in response thereto, providing data signals indicative of the location and orientation of said image scanner relative to said transparency.

4,797,545

OPTICAL HEAD DEVICE HAVING POSITIONALLY ADJUSTABLE PARTS

Shinsuke Shikama; Mitsushige Kondo, and Eiichi Toide, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

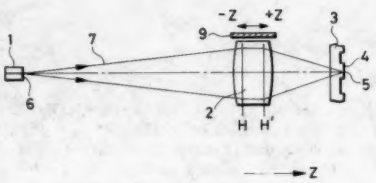
PCT No. PCT/JP86/00416, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/01466, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 14, 1986, Ser. No. 52,860

Claims priority, application Japan, Sep. 10, 1985, 60-200163

Int. Cl.[4] G01J 1/20

U.S. Cl. 250—201 **12 Claims**



1. An optical head device including a semiconductor laser and a finite conjugate type condensing lens for concentrating a beam of light which is emitted by said laser, the device comprising:

altering means for altering the distance between said lens and said laser along the optical axis thereof to reduce the spherical aberration of said beam concentrated through said lens.

4,797,546

METHOD FOR READING A LIGHT-SENSITIVE ELEMENT CONSTITUTED BY A PHOTODIODE AND A CAPACITOR

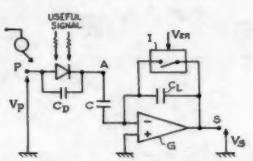
Jean L. Berger, and Marc Arques, both of Grenoble, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 16, 1987, Ser. No. 3,890

Claims priority, application France, Jan. 17, 1986, 86 00656

Int. Cl.[4] H01J 40/14; H04N 3/14

U.S. Cl. 250—214 R **5 Claims**



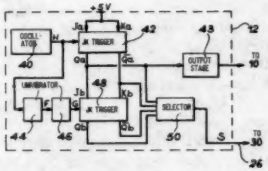
1. A method for reading a quantity of charge produced by illumination of a photodetective element, said photodetective element comprising a photodiode in series with an associated capacitor, said capacitor and photodiode connected to a common node, said photodiode having a forward threshold voltage beyond which it is conductive in a forward direction, in which said photodiode is reverse biased during illumination and may be forward biased by means of periodic reading pulses, wherein, after each periodic read pulse, a constant biasing charge background is applied to said common node, said constant biasing charge background being such that during a next read pulse the photodiode is forward biased beyond its threshold voltage even when illumination is at zero level, said constant biasing charge background being obtained by restoring to a predefined value, after each read pulse, a voltage across the diode.

4,797,547

OPTICAL FIBRE MONITORING DEVICE USING A SYNCHRONIZATION SELECTOR TO CHANNEL OPTICAL SIGNALS

Floréal Blanc, Verrieres le Buisson, and Claude Bonnejean, Courcouronnes, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 18, 1987, Ser. No. 50,461
Claims priority, application France, May 30, 1986, 86 07809
Int. Cl.[4] G01V 9/04
U.S. Cl. 250—221 9 Claims



1. An optical fiber monitoring device comprising:

a light emitting diode coupled to an optical emission fiber;

a photoreceiver coupled to an optical reception fiber;

a control system comprising an emission control module for controlling the emission of the light-emitting diode, a preamplifier module connected to a photoreceiver and a processing module for processing a preamplified signal wherein said processing module is connected to said preamplifier module, and

wherein said emission control module comprises an oscillator producing a pulse train having a first repetition rate, a first JK-type trigger having an input connected to said oscillator and two complementary outputs supplying a first set of two complementary logic signals Qa, $\overline{Qa}$ of a second repetition rate which is one half of the first repetition rate, a first univibrator connected to said oscillator, a second univibrator connected to said first univibrator, a second JK-type trigger having an input connected to said second univibrator and a second set of two complementary outputs supplying a second set of two complementary logic signals Qb, $\overline{Qb}$, a synchronization detector having four inputs respectively connected to the four outputs of said two JK triggers and wherein said synchronization detector has an output supplying one of said two sets of two complementary logic signals Qa, $\overline{Qa}$, Qb, $\overline{Qb}$, an output stage connected to the first output of said first JK trigger and receiving the signal Qa and having an output connected to said light emitting diode, and

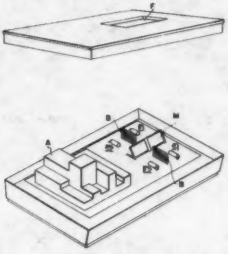
wherein said processing module is a synchronous detection type processing module comprising an input connected to the output of said preamplifier module, a band pass filter, an amplifier connected to said filter, a synchronous detection circuit comprising two complementary channels wherein each of said complementary channels comprises an amplifier and a sampler with said samplers being respectively controlled by the synchronization signal supplied by said synchronization selector and by the complementary signal obtained by a logic inverter, a low pass filter connected to said two samplers, an amplifier providing an analog output for said processing module, and a threshold circuit connected to an amplifier and having an output of said threshold circuit which constitutes a logic output for said processing module and wherein said processing module further comprises a time lag circuit connected to the output of said threshold circuit and an inhibiting input and an output connected to an alarm circuit wherein said control system further includes a means for detecting the possible failure of said light-emitting diode and wherein said means for detecting providing an output to said inhibiting input.

4,797,548

REFLECTION LIGHT BEARER SYSTEM WITH SELF-TESTING FEATURE

Heinz Köbbing, Dortmund, and Hermann Gebhard, Castrop-Rauxel, both of Fed. Rep. of Germany, assignors to Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,860
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3629715
Int. Cl.[4] G01V 9/04; G06M 7/00
U.S. Cl. 250—221 20 Claims



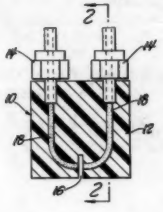
1. A reflection light barrier, comprising measuring light emitter means which emits light into a space to be monitored, measuring light receiver means which receives light reflected from an object present in the space to be monitored, at least one further light receiver means which receives the light of the measuring light emitter means without emission into and reflection from said space to be monitored, and at least one further light emitter means which emits light only in a test cycle which light is received by the measuring light receiver means without emission into and reflection from said space to be monitored.

4,797,549

OPTICAL SENSOR AND METHOD OF MAKING SAME

Thanh Ho, Indianapolis, and Gerald T. Fattic, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1987, Ser. No. 118,474
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 5 Claims



4. The method of making an optical sensor with aligned spaced optical fibers comprising the steps of;

forming a generally U-shaped bend in an optical fiber such that the fiber path has a straight portion in the bend as well as a curved portion,

supporting the fiber in a straight recess of a mold to secure the straight portion,

molding the U-shaped bend of the fiber in an epoxy material to maintain the fiber shape,

exposing the straight portion of the fiber by removing the mold,

cutting a segment of the exposed straight portion of the fiber element along spaced planes perpendicular to the fiber axis to form a pair of parallel faces defining a gap with axially aligned fiber optic portions adjacent the gap, and

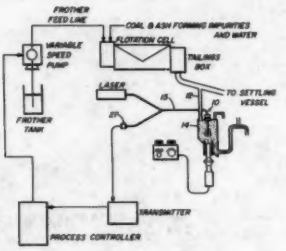
polishing the faces.

4,797,550

FIBER OPTIC DETECTOR FOR FLOTATION CELL PROCESSING

Michael G. Nelson, and Hayward B. Oblad, both of Bethel Park, Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Nov. 6, 1987, Ser. No. 117,263
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **5 Claims**



1. An apparatus for automatically monitoring the operatsion of a froth flotation cell for extracting coal from a coal slurry, the cell having an outlet from a tailings box; comprising

(a) a canister for receiving tailings from a bypass line out of the tailings box;

(b) a fiber optic cable having randomized filaments terminating in a scanner end portion adapted to be inserted into said canister;

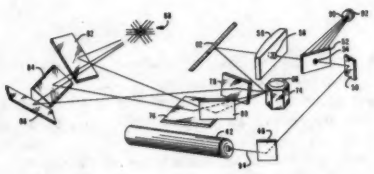
(c) said cable being bifurcated at the opposed end spaced from the slurry and having randomized filaments contacting a light source and randomized filaments contacting a light receiving photoelectric sensor, said light source filaments transmitting light to said scanning end portion, and said light receiving filaments transmitting backscattered light from the tailings to said photoelectric sensor to sense the hue of the color of the tailings to monitor the operation of the flotation cell.

4,797,551

COMPACT LASER SCANNER OPTICAL SYSTEM

Ronald A. Ferrante, Senecaville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 11, 1987, Ser. No. 60,586
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—234 **12 Claims**



1. An optical scanning apparatus for reading bar code symbols on objects passing over the scanning apparatus comprising a housing structure which includes:

a base member;

a cover member having an aperture therein through which scanning light beams are projected and past which aperture a merchandise item bearing a coded label is moved;

oppositely located first and second wall members;

a support member mounted between said first and second wall members intermediate said base and cover members;

a source of a coherent light beam secured to said first wall member above said support member for projecting the light beam along the top surface of said support member;

first and second light reflecting means mounted on the top surface of said support member for receiving said light beam and reflecting the light beam along a first light path;

light transmitting means mounted on said support member in said first light path and adjacent said second light reflecting means for transmitting the light beam along a second light path;

third reflecting means mounted on said support member in said second light path and at an acute angle to said support member for reflecting the light beam in a downward direction along a third light path in the same vertical plane as the second light path but in the opposite direction;

scanning means mounted on said base member below said support member and in said third light path for cyclically sweeping the light beam along a plurality of fourth light paths;

fourth reflecting means mounted in said fourth light paths and to the bottom surface of said support member for reflecting the light beam along a plurality of fifth light paths; and

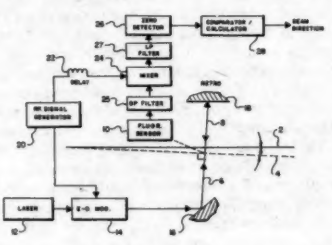
fifth reflecting means mounted in said fifth light path and on said base member adjacent the cover member for reflecting the light beam through said aperture in the cover member for scanning a bar code label positioned adjacent said aperture.

4,797,552

APPARATUS AND METHOD FOR LOCATING THE DIRECTION OF AN ATOMIC BEAM

Duncan G. Steel, Ann Arbor, Mich., and R. Steven Turley, Newbury Park, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 9, 1987, Ser. No. 23,844
Int. Cl.[4] H01S *1/00*
U.S. Cl. 250—251 **22 Claims**



1. A system for measuring the angle between an atomic beam and a reference axis for the beam, comprising:

means for generating and directing a pair of laser beams having the same frequency through the atomic beam at known angles to the reference axis,

means for varying a characteristic of the two laser beams, the varied characteristic being selected from the laser beam frequencies and their angles relative to the atomic beam,

means for sensing the laser beam intensities as said characteristic is varied,

means for obtaining the derivatives of the sensed laser beam intensities, and

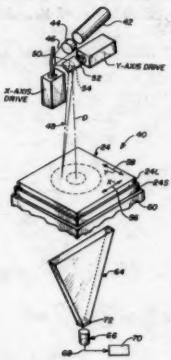
means for measuring the interval over the varying laser beam characteristic between the derivatives crossing zero as an indication of the angular deviation between the actual atomic beam axis and the laser beams, and thereby of the angular deviation between the actual beam axis and the reference axis.

4,797,553

METHOD AND APPARATUS FOR READING A TRANSPARENT PHOTOSTIMULABLE LUMINESCENT SCREEN

Edward B. Caruthers, Jr., Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed May 11, 1987, Ser. No. 48,650
Int. Cl.[4] G01N *23.04*
U.S. Cl. 250—327.2 **5 Claims**



1. A method for interrogating a transparent phosphor screen in which image information has been stored by positioning the screen at a predetermined location with respect both to a source of a high energy imaging beam and an object being examined so that the imaging beam passes through the volume of the screen along predetermined paths to create a predetermined angular distribution of image information within the volume of the phosphor, comprising the steps of:

positioning the screen with respect to a source of a beam of interrogating radiation such that the interrogating beam passes through the volume of the screen along substantially the same paths as the imaging beam; and

scanning the beam of interrogating radiation in a predetermined pattern across the screen.

4,797,554

ION MOBILITY SPECTROMETER

William C. Blanchard, Phoenix, and Allan T. Bacon, Baltimore, both of Md., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 24, 1987, Ser. No. 137,700
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—287 **2 Claims**

1. An ion mobility spectrometer comprising:

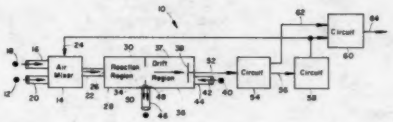
an air mixer having a first input port for receiving clean air and a second input port for receiving sample air, said air mixer having a control input responsive to electrical signals for controlling the mixture of said clean air received from said first input port to said sample air received from said second input port,

said air mixer having an output port coupled to the inlet of the reaction region, said reaction region including means for generating ions from said mixed clean air and sample air to form reactant ions and sample ions from selected sample molecules in said sample air,

means for introducing said ions into a drift region,

said drift region including means for measuring the amplitude and mobility of reactant ions and sample ions in said drift region,

said means for measuring including means for generating a first electrical signal indicative of the reactant ion amplitude,



first means for generating a second electrical signal from said first electrical signal indicative of a desired air mixture of said clean air to said sample air in response to the amplitude of said first electrical signal, said second electrical signal coupled to said control input of said air mixer, and

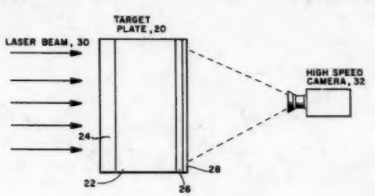
second means coupled to said first and second electrical signals for generating a third electrical signal indicative of the concentration of said sample molecule in said sample air.

4,797,555

HIGH ENERGY LASER TARGET PLATE

Charles R. La Mar, Marietta, Ga., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 28, 1987, Ser. No. 55,092
Int. Cl.[4] G01T *1/00*; G01J *5/48*
U.S. Cl. 250—336.1 **6 Claims**



1. Apparatus for determining the intensity profile of a beam of radiant energy comprising:

a metallic plate substrate having a first planar surface and an opposed second planar surface;

a first metallic layer disposed on said first surface of said substrate and being positioned to be irradiated by said beam of radiant energy;

a layer of temperature sensitive paint disposed on said second surface of said substrate and undergoing a change of phase from a solid phase to a liquid phase when subjected to a predetermined temperature;

and optical recording means for recording an indication of the intensity profile of said beam, said optical recording means being focused on said layer of temperature sensitive paint.

4,797,556

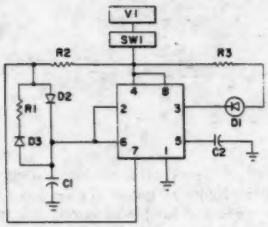
OPTICAL CONTINUITY TESTING APPARATUS WITH PULSATING TRANSMITTER

Robert L. Marzari; Robert K. Southard, and William J. Stape, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 842,613, Mar. 21, 1986. This application Oct. 7, 1987, Ser. No. 105,800

Int. Cl.[4] G02B 27/00

U.S. Cl. 250—551 11 Claims



1. Apparatus for receiving an optical test signal from a transmitter pulsating at a selected repetition rate comprising, optical detector means for sampling the test signal and generating a voltage signal pulsating at said repetition rate and with an amplitude proportionate to the amplitude of the sampled test signal, an indicator for indicating the amplitude of the sampled test signal, amplifying means connected between the indicator and the detector means, and a filter circuit for eliminating voltage signals resulting from optical sources other than said test signal.

4,797,557

POSITION SENSING SYSTEM FOR A MOVING OBJECT WHEREIN A LENS FOCUSES LIGHT ONTO A RADIATION SENSITIVE MATRIX

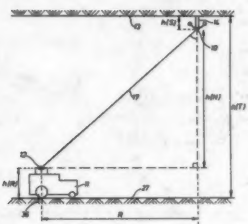
Carl G. Öhman, Atvidaberg, Sweden, assignor to Aktiebolaget Electrolux, Sweden

Filed May 14, 1987, Ser. No. 49,565

Claims priority, application Sweden, May 23, 1986, 8602369

Int. Cl.[4] G01V 9/04

U.S. Cl. 250—561 4 Claims



1. An electro-optic position system for a mobile robot moving in a plane comprising at least one light source mounted in a fixed position and emitting light, a light receiver on said robot having a lens arrangement, means in said system for calculating the position of said robot relative to said light source, said light source so mounted and arranged whereby the radiation field of the light source covers the complete area within which said robot is capable of movement, said light receiver being provided with a matrix of radiation sensitive elements, said lens arrangement focusing incident light from said light source to a light spot on said matrix whereby said elements thus illuminated responding by emitting corresponding electric signals, means being provided for sensing the matrix to determine the position of said light spot from the element which unambiguously reacts to incident light, and calculating means for calculating the position coordinates of the robot in the plane of movement from the position of said unambiguously reacting element in said matrix, said calculating means being arranged to present the position coordinates in a polar form, and means being provided which during movement of the robot in a predetermined direction repeatedly compares each value of the polar angle coordinates with the immediately preceding value in order to detect and correct a turning of the robot relative to a predetermined direction.

4,797,558

INSPECTION APPARATUS INCLUDING PHOTODETECTION AND SCANNING APPARATUS

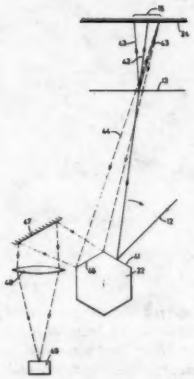
Robert N. West, Chislehurst, England, assignor to Sira Limited, Chislehurst, England

Filed Apr. 28, 1987, Ser. No. 43,654

Claims priority, application United Kingdom, Apr. 28, 1986, 8610305

Int. Cl.[4] G01N 21/88; H01J 3/14

U.S. Cl. 250—572 8 Claims



1. Inspection apparatus comprising:

a radiation source;

a rotatable mirror scanner having a plurality of facets so that, as the mirror scanner rotates, it scans a beam of radiation from the radiation source across an object to be inspected by reflection from a suitably disposed facet of the mirror scanner; and

a plurality of radiation detector means, one of the radiation detector means receiving the central part of the beam of radiation, after it has been influenced by the object, via said suitably disposed facet of the mirror scanner, and another of the radiation detector means being positioned to receive radation scattered by the object and reflected by another facet of the mirror scanner.

4,797,559

METHOD AND APPARATUS FOR CONTROLLING A FLOTATION CELL

Hayward B. Oblad; Michael G. Nelson, both of Bethel Park, and Thomas D. Sandbrook, Eighty Four, all of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Nov. 6, 1987, Ser. No. 117,264

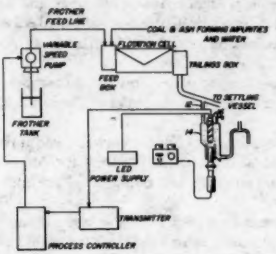
Int. Cl.[4] H01J 5/16, 40/14

U.S. Cl. 250—227 11 Claims

1. Method of controlling the operation of a flotation cell to

which additives such as a frother and collector are added for extracting coal from a coal slurry; comprising

(a) coacting a light sensitive detector with the slurry to determine the coal content of the slurry, and



(b) adjusting the flow rate of additives to the flotation cell in response to the function of the detector.

4,797,560

MATRIX OF PHOTOSENSITIVE ELEMENTS AND AN ASSOCIATED READING METHOD IN IMAGE FORMATION

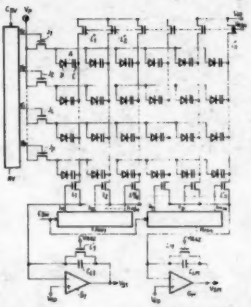
Jean L. Berger, and Marc Arques, both of Grenoble, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 16, 1987, Ser. No. 3,891

Claims priority, application France, Jan. 20, 1986, 86 00716

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **6 Claims**



1. A matrix of photosensitive elements including an assembly of p lines of n columns of photosensitive elements, each element having a first and second terminal, wherein each element includes in series a photodiode and a capacitor, said photodiode and capacitor connected to a common node, said photodiode having a forward threshold voltage beyond which it is conductive in a forward direction, said matrix comprising means for reverse biasing said photodiodes during an illumination phase, means for applying to said lines a periodic reading pulse after an illumination phase, means for setting on said common node, after each reading pulse, a constant biasing charge background, said constant biasing charge background being such that during a next reading pulse the photodiode is forward biased beyond its threshold voltage even when illumination is at a zero level during an illumination phase preceding said reading pulse.

4,797,561

READING APPARATUS WITH IMPROVED PERFORMANCE

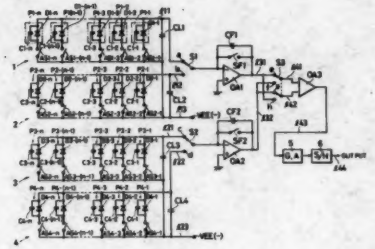
Hiromitsu Tajiri; Yasuo Nishiguchi, and Chiaki Matsuyama, all of Kagoshima, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Aug. 28, 1986, Ser. No. 901,898

Claims priority, application Japan, Aug. 31, 1985, 60-192360; May 30, 1986, 61-127010; Jun. 9, 1986, 61-134155

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **5 Claims**



1. A reading apparatus, comprising:

a plurality of groups of reading elements wherein each group of reading elements is coupled in parallel to define a common output, wherein each element comprises a photodetector and a reading switch coupled in series with the photodetector and wherein each photodetector comprises a light detecting element having an impedance corresponding to received light and a capacitor coupled in parallel with the light detecting element;

an operational amplifier having an output;

switching means for coupling the common output of one group at a time to the operational amplifier input;

a feedback capacitor coupling the output of the operational amplifier to the input of the operational amplifier;

a feedback switch coupled in parallel to the feedback capacitor;

means for selectively switching the reading switches on and off so that one reading switch of a group is turned on at a time to thereby activate the reading elements; and

means for selectively turning the feedback switch on if the reading switches are off and for turning the feedback switch off when any of the reading switches are on.

4,797,562

IMAGE RECORDING SENSOR

Klaus Dietrich, Gochsheim, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 109,185

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635687

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **9 Claims**

1. An image recording sensor including a preselected line-shaped pattern of photodetectors for recording an image, said photodetectors being coupled to an image processing circuit, which image recording sensor comprises:

at least one part of said image processing circuit comprising a plurality of discrete circuit cells;

each of said discrete circuit cells being electrically coupled to a complementary one of said photodetectors;

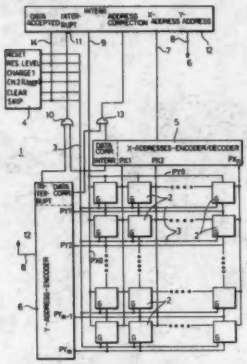
said plurality of discrete circuit cells being coupled to an address circuit means operable to generate electrical signals which selectively define an address for each of said discrete circuit cells;

each of said discrete circuit cells including:

an input control circuit for receiving external control signals to selectively activate and control said cell;

a capacitor for accepting the photocharge of said complementary one of said photodetectors;

a voltage comparator operable to compare the voltage of said capacitor with a comparison voltage; and



an output circuit coupled to said voltage comparator and operable when the voltage of said capacitor is greater than said comparison voltage to transmit a signal to said address circuit means to thereby generate an electrical signal representative of the address of said cell.

4,797,563

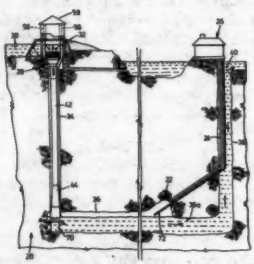
POWER PLANT

Timothy M. Richardson, R.R. #3, Old Scone Mill, Chesley, Ontario, Canada N0G 1L0

Filed Jul. 24, 1987, Ser. No. 77,358

Int. Cl.[4] F02C *3/12*

U.S. Cl. 290—54 **9 Claims**



1. A power plant, comprising:

a hydraulic air compressor including: a water intake in a stream of water at an upper level and a water outlet at a lower level in said stream, said intake being adapted to entrain air with water entering said intake; an air compressor shaft in the ground, said shaft communicating at an upper level with said intake and permitting entrained air to be compressed by water moving downward in said shaft; an air separation and storage chamber in the ground communicating with a lower end of said shaft and in which air is allowed to bubble to the surface of the water and is trapped in the chamber above the water; a return shaft for delivering water from said chamber to said water outlet in the water stream; and a compressed air outlet from said chamber;

A turbine having a compressed air inlet; burner means for heating said compressed air; an expansion chamber for receiving said heated compressed air; an exhaust outlet downstream of said expansion chamber; and a rotary shaft carrying driven turbine blades, said blades being located in said expansion chamber for driving by hot gases expanding in said chamber;

means for preventing water flow to said turbine in the event that water enters said air outlet of the hydraulic air compressor;

heat exchanger means coupled between said turbine exhaust outlet and said air control means for pre-heating compressed air entering said compressed air inlet of the turbine; and,

generator means coupled to said rotary turbine shaft;

wherein said tubine is an axial-flow gas turbine;

and wherein said rotary shaft of the turbine has a first end portion at which said turbine blades are located, and a second end portion, said air inlet of the turbine being disposed between said first and second end portions and said second end portion of the shaft being provided with a balance piston for counteracting axial thrust exerted on the shaft by combustion gases acting on said turbine blades.

4,797,564

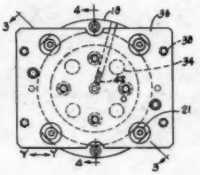
ROBOT OVERLOAD DETECTION MECHANISM

Valdas S. Ramunas, Euclid, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Aug. 25, 1986, Ser. No. 900,307

Int. Cl.[4] B25J *9/00*; B23K *9/12*

U.S. Cl. 307—119 **24 Claims**



1. An overload detection mechanism for a robot arm comprising, in combination:

a first member having a Z axis;

a second member having a second axis;

urging means acting between said members to urge said members toward axial alignment on said Z axis;

guide means to guide said second member in movements departing from coaxial alignment on said Z axis;

means to support said first member near the end of a robot arm;

means to connect said second member to a tool mount for the end of a robot arm;

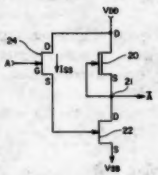
an electrical device mounted on one of said members and a device actuator on the other of said members; and

reactions means acting between said members to relatively move said members upon thrust along a Z axis, or movement in an X-Y plane normal to said Z axis, whereby due to overload on said second member said first and second members are relatively moved and said electrical device is actuated to change an electrical condition thereof.

4,797,565
CASCADE FET LOGIC CIRCUITS

Lawrence E. Lach, Chicago, and Mikiharu Ohoka, Schaumburg, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill. and Nippon Mining Co., Ltd., Japan

Filed Mar. 13, 1987, Ser. No. 25,899
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—450 25 Claims

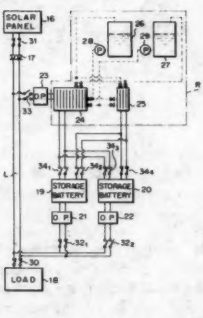


25. A logic circuit, comprising:
a first potential node;
a second potential node;
a first group III–V field effect transistor having a first gate, having a first source, and having a first drain, said first gate receiving an input signal;
a second group III–V field effect transistor having a second gate, having a second source, and having a second drain, said first drain and said second drain being coupled at said first node to receive said first potential, said second gate and said second source being coupled together; and
a third group III–V field effect transistor having a third source receiving said second potential, having a third drain coupled to said second source, and having a third gate coupled solely to said first source.

4,797,566
ENERGY STORING APPARATUS

Ken Nozaki, and Yuichi Akai, both of Ibaragi, Japan, assignors to Agency of Industrial Science and Technology and Ebara Corporation, both of Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 19,621
Claims priority, application Japan, Feb. 27, 1986, 61-40361
Int. Cl.[4] H02J *9/04*; H01M *8/20*
U.S. Cl. 307—43 11 Claims

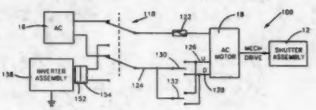


1. An energy storing apparatus including power generating means, a load and power lines interconnected between said electric power generating means and said load, comprising:
lead-acid storage battery means;
flowing type battery means;
first switch means for connecting said lead-acid battery means with said power lines;
second switch means for connecting said flowing type battery means with said power lines;
third switch means for connecting said lead-acid battery means with said flowing type battery means;
wherein such first, second and third switch means are selectively operated so that said lead-acid battery means and said flowing type battery means are charged by surplus electric energy when the amount of electric energy supplied from said electric power generating means is larger than the amount of electric energy being consumed by said load, that said lead-acid battery means supplies the electric energy stored therein to said load when the amount of electric energy consumed by said load is larger than the amount of electric energy supplied from said electric energy generating means, and that said flowing type battery means operates to charge said lead-acid battery means.

4,797,567
SHUTTER CONTROL APPARATUS

Greg Pappas, 8490 York Rd., North Royalton, Ohio 44133

Filed Jan. 27, 1987, Ser. No. 6,915
Int. Cl.[4] H02J *9/06*
U.S. Cl. 307—66 5 Claims



1. An apparatus for actuating from outside of a building an electric motor drive for winding and unwinding a shutter on the building, said apparatus comprising:
switch means located outside of the building and having a first position in which it connects the main electric current supply of the building with said electric motor drive;
an auxiliary electric power source for directing electric power to said electric motor drive when the main electric power supply is lost;
access means located outside of the building and connected with said auxiliary electric power source for connecting said auxiliary electric power source and said electric motor drive; and
said switch means having a second position in which it connects said access means with said electric motor drive.

4,797,568
ELECTRONIC SWITCHING SYSTEM FOR CONTROLLING INDOOR AND OUTDOOR LIGHTS

Curtis M. Gumbs, 333 College Dr., Edison, N.J. 08817

Filed Aug. 21, 1987, Ser. No. 87,889
Int. Cl.[4] H01H *43/00*
U.S. Cl. 307—141 26 Claims

1. an electronic switching system for automatically illuminating and delay in extinguishing of outdoor/indoor lights and electrical wall receptacles, in which said system's integrated circuits and mounted on a printed circuit board, said system comprising:
an input/output barrier block having a pair of power input screw terminals and a pair of power output screw terminals, which comprises a screw-type barrier block having posts to connect a first set of wires underneath, a second set of wires one black one white, a relay, and a fuse, the screw-type barrier block being mounted on the etching side of the printed circuit board to receive and output 115 V 60 Hz and the second set of wires being connected in parallel to the posts of input and output terminals of the barrier block, with the relay and fuse in series with the black wire, so that energizing the relay places corresponding ones of the power input and output screw terminals in parallel;
a manual power on/off circuit;

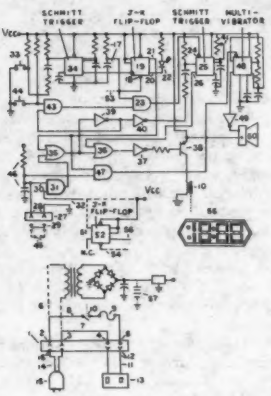
an automatic sensing circuit;

means for generating a delay pulse;

a relay drive circuit which comprises a first OR gate cascaded to a second OR gate, a first inverter, and a relay drive transistor, whereby the first OR gate receives a logic one signal from the manual power on/off circuit and the automatic sensing circuits when said circuits are actuated, which signal is then cascaded to the second OR gate which also receives a delay pulse from said delay pulse generating means, and means for inverting the output of the second OR gate to turn 'ON' and 'OFF' the relay drive transistor to energize and de-energize the relay;

said means for generating a delay pulse being a delay circuit which comprises a first Schmitt trigger with a delay adjusting means, a manual delay reset AND gate cascaded to a power-up reset AND gate, and a second inverter cascaded to a third inverter, whereby the third inverter permits a high to low transition to be detected by the first Schmitt trigger, which generates a delay pulse having a corresponding delay value equal to the desired duration to which the delay adjusting means has been set, to keep the relay energized for the same duration and then to de-energize the relay;

said manual power on/off circuit comprising a first J-K flip-flop with $\overline{Q}$ and Q outputs, a manual power on/off



indicator, a second Schmitt trigger, and a manual power on/off switch, interconnected so that depressing said switch generates a pulse from the second Schmitt trigger, which toggles and latches the J-K flip-flop outputs to 'ON' and 'OFF' conditions, with the power on/off indicator connected to the $\overline{Q}$ output and providing a visual indication of said condition;

said automatic sensing circuit comprising an automatic sensing AND gate, a resistor and capacitor network for mechanical debounce, and input sense terminals, so that sensors for automatically operating the system may be connected to said sense terminals and the state of said sensors may be detected by the automatic sensing AND gate as an open or closed circuit, which automatic sensing AND gate sends a logic one to the relay drive circuit for an open detection and a logic zero for a closed detection;

said manual power on/off circuit including a manual power 'ON' circuit which comprises a manual power 'ON' sensing AND gate, a multivibrator circuit, a fourth inverter, and an alarm, interconnected so that activating the relay drive circuit as a result of actuation of both the manual power on/off and automatic sensing circuits causes the alarm to emit an audible signal at the same frequency as the multivibrator circuit; and

a power supply including a transformer, the transformer having power input wires connected in parallel with the posts of the power input screw terminals to supply power to the system's integrated circuits,

the automatic sensing circuit including means to detect an open circuit condition at the input sense terminals so as to automatically illuminate lights in response to the open circuit condition,

the delay circuit being responsive to initiation of a closed circuit condition at the input sense terminals to initiate the delay,

the manual power on/off circuit permitting the outdoor/indoor lights and electrical wall receptacles to be operated independently of the automatic sensing circuit,

the manual power 'ON' circuit causing an audible warning signal to be generated when the power on/off and the automatic sensing circuits are both activating the relay drive circuit,

the delay circuit being responsive to the last high to low transition from the output of the first cascading OR gate to generate said delay pulse to keep the lights and wall receptacles illuminated or energized respectively for the duration of the delay and then to extinguish the same.

4,797,569

APPARATUS FOR PRE-DEFINING CIRCUIT CHARACTERISTICS

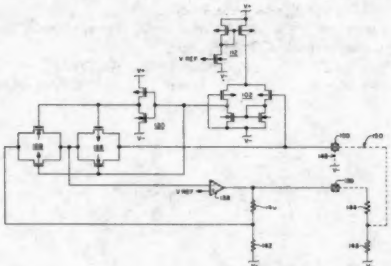
Ziya G. Boyacigiller, Hayward, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Continuation of Ser. No. 9,051, Jan. 27, 1987, Pat. No. 4,752,700, which is a continuation of Ser. No. 697,200, Jan. 31, 1985, abandoned. This application Oct. 28, 1987, Ser. No. 114,546

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[4] H03K *5/24, 3/01;* **G05F** *1/46*

U.S. Cl. 307—297 **8 Claims**



1. A voltage selection circuit for providing a regulated voltage, the value of which is chosen from between an internal fixed voltage and an externally supplied fixed voltage, including:

an input terminal,

a comparator, said comparator including a first comparator P-channel transistor having its gate connected to said input terminal and its drain connected to a first node, a first comparator N-channel transistor having its source connected to a source of a first voltage and its drain and gate connected to the source of said first comparator P-channel transistor, a second comparator P-channel transistor having its drain connected to said first node, and its gate connected to said source of a first voltage, a second comparator N-channel transistor having its drain connected to the source of said second comparator P-channel transistor, its gate connected to the gate of said first N-channel transistor and its source connected to said source of a first voltage, the output of said comparator

comprising the connection between the source of said second comparator P-channel transistor and the drain of said second comparator N-channel transistor, wherein the output of said comparator assumes a first state if the voltage on said input terminal is equal to or less than said first voltage and assumes a second state if the voltage on said input terminal exceeds said first voltage,

a constant current source connected to said first node,

an inverter, having an input and an output, said input connected to the output of said comparator,

a voltage follower amplifier having an input and an output connected to an output terminal,

a first switch, connected between said input terminal and said input to said voltage follower amplifier, including control means, responsive to the output of said comparator, for activating said first switch when said comparator is in said second state,

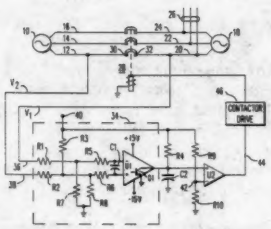
a second switch, connected between said input of said voltage follower amplifier and a source of an internal reference voltage, including control means, responsive to the output of said comparator, for activating said second switch when said comparator is in said first state.

4,797,570

AUTOMATIC PARALLELING OF AC POWER SOURCES

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1987, Ser. No. 80,031
Int. Cl.[4] H02J *3/00*
U.S. Cl. 307—87 **4 Claims**



1. A system for effecting paralleling operation of a first alternating current electrical power source with a second alternating current electrical power source, said system comprising:

means for monitoring the difference voltage occurring between output voltages on corresponding phases of first and second alternating current electrical power sources;

a capacitor connected to an output of said means for monitoring;

means for charging said capacitor;

said means for monitoring including means for shorting said capacitor when the difference voltage occurring between the output voltages on corresponding phases of said first and second alternating current electrical power sources exceeds a first predetermined threshold level;

control means for effecting the electrical connection of voltage outputs of said first and second electrical power sources; and

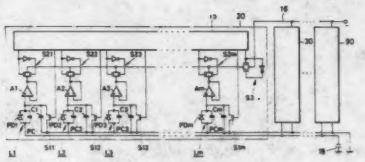
means for inhibiting said control means until the voltage on said capacitor reaches a second predetermined threshold level.

4,797,571

CONTACT TYPE IMAGE SENSOR

Takashi Ozawa, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Continuation of Ser. No. 736,690, May 22, 1985. This application Jun. 18, 1987, Ser. No. 63,779
Claims priority, application Japan, May 23, 1984, 59-103997
Int. Cl.[4] H03K *3/42*; H01L *27/02*; H01J *40/14*
U.S. Cl. 307—311 **5 Claims**



1. A contact type image sensor comprising:

(a) a plurality of light receiving elements for storing electric charges in response to light incident thereon, said light receiving elements being formed by a plurality of separate electrodes disposed on a substrate, a photoconductive layer, disposed over said separate electrodes, and a transparent electrically conductive layer disposed over said photoconductive layer;

(b) a signal output line for outputting electric charges stored in said plurality of light receiving elements;

(c) a plurality of first switching circuits each provided for a respective one of said plurality of light receiving elements, for discharging the electric charge stored in said light receiving elements;

(d) a plurality of high input impedance amplifiers each provided for a respective one of said plurality of light receiving elements, having an output outputting a voltage corresponding to the amount of electric charge stored in said light receiving elements;

(e) a plurality of second switching circuits each provided for a respective one of said plurality of light receiving elements and comprising complementary CMOS transistors, said CMOS Transistors having gates, and an inverter which is connected between said gates of said CMOS transistors for sequentially switching the output of said high input impedance amplifiers; and

(f) a third switching circuit comprising a CMOS transistor and an inverter, and having an input terminal commonly connected to every output of said plurality of second switching circuits and an output terminal connected to said signal output line.

4,797,572

TRIGGER RE-SYNCHRONIZATION CIRCUIT

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

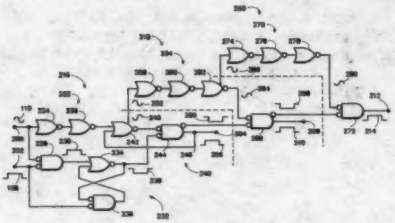
Filed Jan. 21, 1987, Ser. No. 6,816
Int. Cl.[4] H03K *5/13, 17/00, 5/159, 4/08*
U.S. Cl. 307—269 **37 Claims**

1. In combination with a trigger signal generating circuit having a first trigger gating means coupled and responsive to a trigger source signal and holdoff signal, said first trigger gating means providing a first trigger signal, a trigger re-synchronization circuit comprising:

a first trigger source signal delay means having an input and an output, said input being coupled to receive said trigger source signal and said output providing a first delayed trigger source signal; and

a second trigger gating means coupled and responsive to said

first trigger signal and said first delayed trigger source signal, said second trigger gating means providing at its



output a second trigger signal having less jitter than the output of the first trigger gating means.

4,797,573

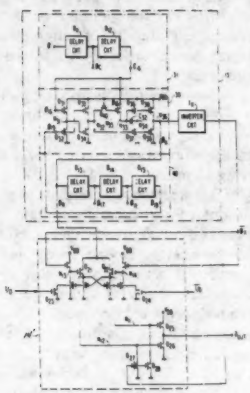
OUTPUT CIRCUIT WITH IMPROVED TIMING CONTROL CIRCUIT

Shoji Ishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 673,454, Nov. 21, 1984. This application Jan. 29, 1987, Ser. No. 8,496

Int. Cl.[4] H03K *5/13*; G11C *7/00*

U.S. Cl. 307—269 **1 Claim**



1. A timing-controlled circuit comprising a first terminal for receiving a control signal; a second terminal for receiving a data signal; a control circuit having an enable terminal, a reset terminal and a control output terminal, each terminal assuming an active level or an inactive level, said control circuit making a level of said control output terminal active when a level of said enable terminal is active and a level of said reset terminal is inactive, and making said output terminal inactive when a level of said enable terminal is active and level of said reset terminal is active; a delay circuit having an input and an output and having a predetermined delay time; first means coupled to said first terminal and said enable terminal for making a level at said enable terminal active and inactive when said control signal is at a first level and at a second level, respectively; second means for connecting an input of said delay circuit to said control output terminal; third means for connecting an output of said delay circuit to said reset terminal thereby to make said reset terminal active after said predetermined delay time has elapsed from the time when said control output terminal is made active; a data section having an input terminal coupled to said second terminal for processing said data signal and a control terminal; and fourth means coupled to said control output terminal and said control terminal of said data section for enabling said data section only when said output control terminal is at the active level, whereby said data section processes said data signal only during said predetermined delay period from the time when said control output terminal is changed to the active level.

4,797,574

SYNCHRONIZING CIRCUIT

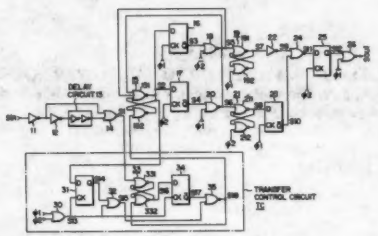
Yasuo Okubo, Tokyo, and Masataka Hirasawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1987, Ser. No. 133,622

Claims priority, application Japan, Dec. 24, 1986, 61-306309

Int. Cl.[4] H03K *5/13, 9/06, 7/00*; G05F *5/00*

U.S. Cl. 307—269 **9 Claims**



1. A synchronizing circuit comprising:

input pulse detecting means for detecting the arrival of an externally applied input pulse signal and generating a pulse signal of a predetermined width;

a first bistable circuit;

first latch means for latching the output signal from said first bistable circuit, in synchronism with a first internal clock signal;

second latch means for latching the output signal of said first bistable circuit, in synchronism with a second internal clock signal, which is different in phase from said first internal clock signal;

reset signal generating means which responds to the output signal from one of said first and second latch means which executed the latching operation, and supplies a reset signal to said first bistable circuit during a period of generation of the clock signal corresponding to the latch means which did not execute the latching operation;

output means for outputting the output signal from said reset signal generating means, in synchronism with one of said first and second clock signals; and

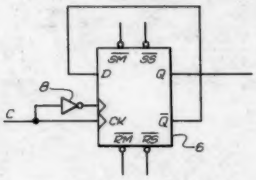
pulse signal transfer control means, which receives the pulse signal output from said detecting means, prohibits said pulse signal from being transferred to said first bistable circuit during a period in which said first bistable circuit is set, a period of generation of said first clock signal, and a period of generation of said second clock signal, and allows the pulse signal to be transferred to said first bistable circuit during a period in which said first and second clock signals are not generated and said period in which said first bistable circuit is reset.

4,797,575

FLIP-FLOP WITH IDENTICAL PROPAGATION DELAY IN CLOCK PASS THROUGH MODE AND IN NORMAL OPERATION

Karl M. J. Lofgren, Long Beach, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Filed Dec. 5, 1986, Ser. No. 938,626
Int. Cl.[4] H03K *3/037, 5/13*
U.S. Cl. 307—272.1 **4 Claims**



1. A flip-flop circuit having master and slave set and master and slave reset input gates that may be independently set so as to select between a first state and a second state, the flip-flop circuit also having a clock input signal and an output signal and its complement, wherein:

during the first state the flip-flop circuit operates such that the output signal value follows the clock input signal value; and

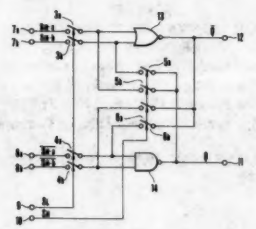
during the second state the flip-flop circuit operates upon the clock input signal such that the input signal follows the identical circuit path as in the first state upon the occurrence of a low to high logic level transition on the output signal, thereby preventing any phase step when selecting between the first state and the second state.

4,797,576

FLIP-FLOP CIRCUIT WITH SHORT PROPAGATION DELAY

Hiroshi Asazawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 5, 1987, Ser. No. 81,877
Claims priority, application Japan, Aug. 18, 1986, 61-191616
Int. Cl.[4] H03K *3/284, 3/29*
U.S. Cl. 307—272.1 **2 Claims**



1. A flip-flop circuit comprising:

a first pair of input terminals for respectively receiving a first pair of input data signals;

a second pair of input terminals for respectively receiving a second pair of input data signals which pair is complement of the first pair of input data signals;

first and second output terminals;

a NOR gate whose output terminal is connected to said first output terminal;

a NAND gate whose output terminal is connected to said second output terminal;

two pairs of latch switches respectively inserted between said first pair of input terminals and two input terminals of said NOR gate, and between said second pair of input terminals and two input terminals of said NAND gate, said two pairs of latch switches being controlled by a latch signal to be turned on/off; and

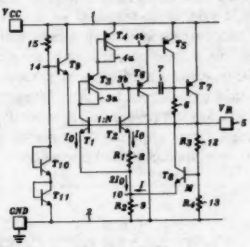
two pairs of hold switches respectively inserted between said two input terminals of said NOR gate and said output terminal of said NAND gate and between said two input terminals of said NAND gate and said output terminal of said NOR gate, said two pairs of hold switches being controlled by a hold signal to be synchronously turned on/off.

4,797,577

BANDGAP REFERENCE CIRCUIT HAVING HIGHER-ORDER TEMPERATURE COMPENSATION

Sam A. Hing, Gland, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1987, Ser. No. 133,778
Claims priority, application United Kingdom, Dec. 29, 1986, 8630980
Int. Cl.[4] G05F *1/567*
U.S. Cl. 307—297 **5 Claims**



1. A bandgap reference circuit comprising first and second transistors coupled in parallel to share a current, each having a first, second and control electrode, the control electrodes of the transistors being coupled together and to an output terminal; first and second resistors connected in series between the first electrode of the second transistor and a reference potential, the first electrode of the first transistor being coupled to a first node between the resistors; a third transistor having an emitter coupled to said first node, a second electrode coupled to the output terminal, and a control electrode; third and fourth resistors connected in series between the output terminal and the reference potential, the control electrode of the third transistor being coupled to a second node between the third and fourth resistors.

4,797,578

ARRANGEMENT FOR ADJUSTING AN IMPEDANCE NETWORK IN AN INTEGRATED SEMICONDUCTOR CIRCUIT

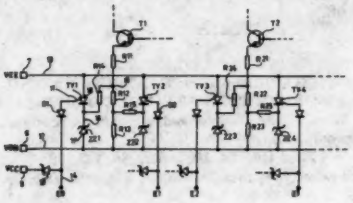
Hans O. Eriksson, Järfälla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 17, 1986, Ser. No. 942,769
Claims priority, application Sweden, Dec. 19, 1985, 8506023
Int. Cl.[4] H01L *27/02*; G05F *5/00*
U.S. Cl. 307—303 **17 Claims**

1. In an integrated semiconductor circuit of the type having first and second power supply terminals for applying an operating current to the circuit and at least one signal terminal for providing an input signal to the circuit during normal operation, an arrangement for adjusting the impedance value of an impedance network within said circuit, comprising:

an adjustment impedance connected to said impedance network;

an adjustment circuit connected between said first and second power supply terminals, said adjustment circuit including a current switching means which can be set into one of two selectable states to respectively close or open a current path from said adjustment impedance to said first or second power supply terminals, and a selectively controllable switch means connected to said current switching means for selectively setting the state of said current switching means, said selectively controllable switch



means having a control electrode connected to said signal input terminal and being responsive to a signal during adjustment at said input terminal to selectively apply a current to said current switching means with at least one of said first and second power supply terminals having a different voltage during adjustment than during normal operation, said signal input terminal being operably connected with means to prevent said selectively controllable switch means from applying current to said current switching means during normal operation.

4,797,579

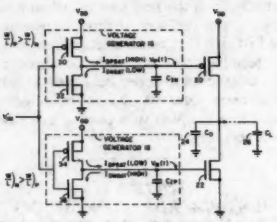
CMOS VLSI OUTPUT DRIVER WITH CONTROLLED RISE AND FALL TIMES

Edward T. Lewis, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 27, 1987, Ser. No. 78,142

Int. Cl.[4] H03K *4/94, 17/16*

U.S. Cl. 307—443 **11 Claims**



1. A CMOS output circuit for producing an output signal comprising:

an input signal applied to said output circuit;

first means coupled to receive said input signal for generating an approximately linear decreasing signal for control of said output signal rise time;

second means coupled to receive said input signal for generating an approximately linear increasing signal for control of said output signal fall time; and means, free of any output feedback connections, for producing said output signal having a first input coupled to an output of said first control means and a second input coupled to an output of said second control means.

4,797,580

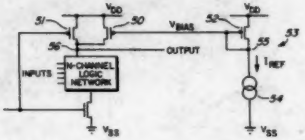
CURRENT-MIRROR-BIASED PRE-CHARGED LOGIC CIRCUIT

Stephen K. Sunter, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1987, Ser. No. 114,552

Int. Cl.[4] H03K *17/16, 19/017, 19/094*

U.S. Cl. 307—451 **8 Claims**



1. A dynamic logic curicut comprising at least one dynamic logic cell and a bias circuit, each dynamic logic cell comprising a first field-effect transistor having a channel extending between a first supply voltage and a pre-charged node of a respective logic network and also comprising a second field-effect transistor having a channel extending between a second supply voltage and the respective logic network, the gate of each of the first and second transistors being connected to a clocked input signal, the bias circuit comprising a third field-effect transistor for each dynamic logic cell and also comprising a fouth field-effect transistor in each dynamic logic cell extending between the first supply voltage and the pre-charged node of the respective logic network, the gate of each of the third transistors being connected to the gate of the fourth transistor, the channel of the fourth transistor extending between the first supply voltage and an intermediate node, the resistance element extending between the intermediate node and the second supply voltage, the gate of the fourth transistor being connected to the intermediate node, whereby all of the transistors and the resistance element are formed as an integral part of an integrated logic circuit, and whereby current flows from the first supply voltage to the pre charged nodes of the logic networks at a steady rate determined by the relative dimensions selected for each of the third transistors and the fourth transistor and by the resistance value selected for the resistance element.

4,797,581

CIRCUIT FOR CONVERTING TRI-STATE SIGNALS INTO BINARY SIGNALS

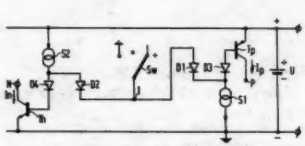
Ingo A. Martiny, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1987, Ser. No. 51,810

Claims priority, application Fed. Rep. of Germany, May 17, 1986, 3616818

Int. Cl.[4] H03K *19/092, 19/00, 17/60*

U.S. Cl. 307—475 **8 Claims**



1. A circuit arrangement for converting tri-state signals into binary signals comprising: an input terminal for receiving the tri-state signals, a first diode path connected between the input terminal and a first node and including a first diode having an anode connected to the input terminal, a first direct current source conducting a first current from the first node towards a

low supply voltage terminal, a second diode path connected between the input terminal and a second node and including a second diode having a cathode connected to the input terminal, a second direct current source conducting a second current from a high supply voltage terminal towards the second node, a first output transistor having a main current path connected between one of the supply voltage terminals and a first output terminal for supplying a first controllable output current and having a control electrode coupled to the first node via a third diode path including a third diode having a cathode connected to the first node, and a second output transistor having a main current path connected between one of the supply voltage terminals and a second output terminal for supplying a second controllable output current and having a control electrode coupled to the second node via a fourth diode path including a fourth diode having an anode connected to the second node.

4,797,582

BIDIRECTIONAL INTERFACE CIRCUIT HAVING A UNIPOLAR PORT AND A BIPOLAR PORT FOR LOGIC SIGNALS

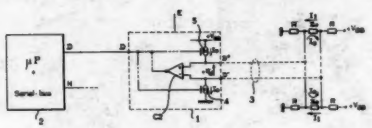
Van T. Nguyen; Claude Chateignon, both of Toulouse, and Georges Deschamps, Montreuil sous Bois, all of France, assignors to Bendix Electronics S.A., Toulouse, France

Filed May 13, 1987, Ser. No. 49,868

Claims priority, application France, May 14, 1986, 86 06936

Int. Cl.[4] H03K *19/092, 17/16, 17/56*

U.S. Cl. 307—475 **8 Claims**



1. Interface circuit for exchanging logic signals between an unipolar port connected to a wire for the transmission of unipolar serial signals and a differential port connected to a pair of wires for the transmission of differential serial signals, characterized in that it comprises:

a first sub-circuit (C2,T1) for transmitting signals from the differential port to the unipolar port;

said signals having a first and second logic state, said first logic state having a first level within a first range ($V_b - V_{L2}$);

a second sub-circuit (C1, T2, T3, T4, T5) for transmitting signals from the unipolar port to the differential port;

said signals having a second level within a second range ($V_{L1} - 0$) for transmission on the differential line of a signal ($+V_d$) representative of said first logic state, said first and second ranges having no common part; and

means responsive to the non-overlapping of said first and second ranges to prevent the looping of said signals representative of said first logic state through the interface circuit from blocking the interface circuit.

4,797,583

LEVEL CONVERTING CIRCUIT FOR CONVERTING VOLTAGE LEVELS, INCLUDING A CURRENT AMPLIFYING ARRANGEMENT

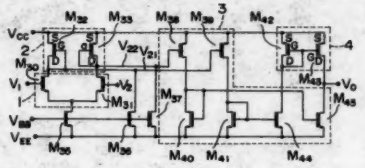
Masahiro Ueno; Kozaburo Kurita; Ikuro Masuda, all of Hitachi, and Nobuaki Miyakawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

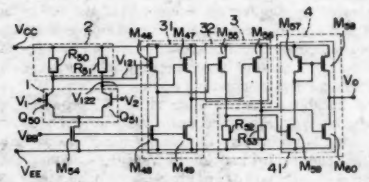
Filed Dec. 19, 1984, Ser. No. 683,501

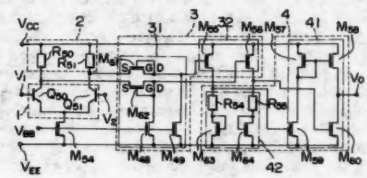
Claims priority, application Japan, Dec. 20, 1983, 58-241642

Int. Cl.[4] H03K *19/092, 19/094, 19/01, 17/04*

U.S. Cl. 307—475 **15 Claims**







1. A level converting circuit for transforming differential input voltages into an output voltage comprising:

voltage-to-current conversion means for transforming said differential input voltages into differential currents;

current detection means coupled to said voltage-to-current conversion means for detecting said differential currents and providing a voltage output corresponding to said detected differential currents;

current amplifying means coupled to said current detection means for amplifying said voltage output of said current detection means and producing a current output corresponding to said amplified voltage output of said current detection means; and

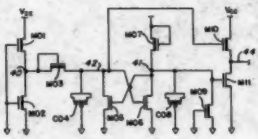
current-to-voltage conversion means coupled to said current amplifying means for transforming and combining said current output of said current amplifying means into an output voltage.

4,797,584

POWER-ON RESET CIRCUIT FOR MOS LOGIC DEVICES

Alberto Aguti, Ponteranica; Maurizio Galbotti, Barlassina, and Vittorio Masina, Corporeno, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Feb. 13, 1987, Ser. No. 14,490
Claims priority, application Italy, Feb. 18, 1986, 19441 A/86
Int. Cl.[4] H03K 5/13, 17/16, 19/20, 3/01
U.S. Cl. 307—594 18 Claims



1. A power-on reset circuit for MOS technology logic networks, for automatically supplying a reset voltage pulse as a supply voltgage is applied, particularly for peripheral units of microprocessors and the like, characterized in that it comprises:

(a) a voltage divider having one and opposite ends and adapted for supplying a reference voltage and comprised of series arranged normally conducting transistors with one end coupled to a reference potential, the opposite end coupled to the supply voltage and defining therebetween a voltage divider coupling point;

(b) a bistable circuit comprised of a decoupling means wherein said decoupling means is comprised of a normally conducting transistor, the gate of which is coupled to its drain and a third and fourth transistors, having their respective gates and drains cross-coupled, and their sources coupled to said reference potential, the drain of said third transistor being coupled to the voltage divider coupling point through said decoupling means and the drain of said fourth transistor being coupled to said supply voltage through a fifth transistor which is coupled as a diode; and

(c) an end stage comprised of a sixth transistor which has its source coupled to said reference potential and its gate coupled to the drain of said fourth transistor, and a seventh transistor having its source coupled to the drain of said sixth transistor and its drain coupled to said supply voltage, the gate of said seventh transistor being coupled to the drain of said third transistor, the sixth and seventh transistors defining therebetween a coupling point forming the output line supplying said reset pulse.

4,797,585

PULSE GENERATING CIRCUIT IN A SEMICONDUCTOR INTEGRATED CIRCUIT AND A DELAY CIRCUIT THEREFOR

Hiroshi Segawa, and Tetsuya Matsumura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 30,662
Claims priority, application Japan, Mar. 31, 1986, 61-74965
Int. Cl.[4] H03K 5/159
U.S. Cl. 307—594 12 Claims

1. A pulse generating circuit in a semiconductor integrated circuit comprising:

a first input terminal for receiving a first signal,

a delay circuit receiving the first signal and producing a second signal delayed with respect to the first signal,

the delay circuit having delay time which is variable by a control signal supplied from the outside,

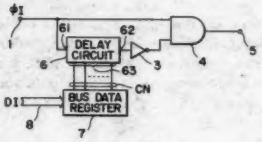
control means connected for supplying the control signal to the delay circuit to vary the delay time, and

logic circuit means for receiving the first and the second signals and producing a pulse having a duration corresponding to the delay time of the second signal with respect to the first signal, wherein the delay circuit comprises

an input terminal,

an output terminal,

a plurality of MOS transistor switching circuits connected in parallel with each other, the parallel connection of the



MOS transistor switching circuits being connected between the input and the output terminal,

a capacitance element connected between the output terminal and a power source terminal, and

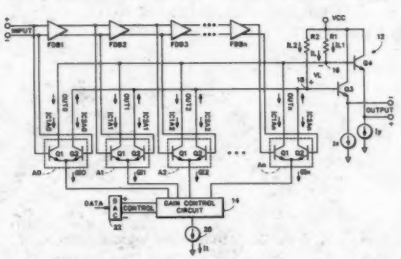
conduction control means for controlling the conduction of the MOS transistor switching circuits to vary the overall resistance of the parallel connection of the MOS transistor switching circuits.

4,797,586

CONTROLLABLE DELAY CIRCUIT

Einar O. Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 25, 1987, Ser. No. 125,023
Int. Cl.[4] H03K 5/13, 17/28
U.S. Cl. 307—603 13 Claims



1. A method utilizing a first and at least two additional amplifiers to provide a delayed output signal that changes state in delayed response to an input signal, the method comprising the steps of:

generating a plurality of delayed signals, each corresponding to a separate one of said additional amplifiers, said delayed signals changing state at differing times in delayed response to a change in state of said input signal;

amplifying said input signal using said first amplifier to produce a first amplifier output, said first amplifier having adjustable gain through a range of amplification;

amplifying said delayed signals using their corresponding additional amplifiers to produce additional amplifier outputs, said additional amplifiers having adjustable gain through a range of amplification; and

combining said first and additional amplifier outputs to produce said output signal.

4,797,587

TRIGGERING METHOD FOR A THYRISTOR SWITCH

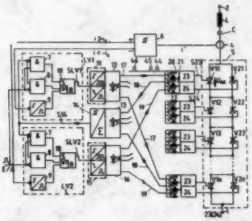
Christoph Tschudi, and Fritz Wittwer, both of Untersiggenthal, Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 30, 1987, Ser. No. 31,862

Claims priority, application Switzerland, Apr. 14, 1986, 1479/86

Int. Cl.[4] H03K 17/72

U.S. Cl. 307—646 27 Claims



1. A triggering method for triggering a thyristor switch containing a multiple number of thyristors encompassing a predetermined number of series connected thyristors and a series connected of a predetermined number of thyristors connected antiparallel to said predetermined number of series connected thyristors, said method comprising the steps of:

generating an on-off signal for switching on the thyristor switch in the presence of the on-off signal and for switching off the thyristor switch in the absence of said on-off signal;

detecting the anode-cathode voltage present at said multiple number of thyristors;

defining a predetermined threshold value of said anode-cathode voltage and comparing the detected anode-cathode voltage with said predetermined threshold value of said anode-cathode voltage;

generating a trigger standby signal of a predetermined duration in the presence of (i) said on-off signal and (ii) an anode-cathode voltage in excess of said predetermined threshold value of said anode-cathode voltage at a preselected number of said multiple number of thyristors; and

triggering at least once said multiple number of thyristors by generating a triggering pulse during said predetermined duration of said trigger standby signal.

4,797,588

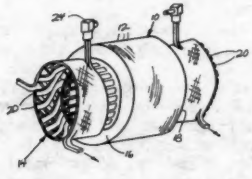
STATOR COOLING FOR DYNAMOELECTRIC MACHINE

Robert L. Capion, Ridott, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 14, 1987, Ser. No. 132,878

Int. Cl.[4] H02K 9/00, 3/46

U.S. Cl. 310—54 15 Claims



1. A dynamoelectric machine including:

a stator having opposed sides;

a rotor-receiving opening in said stator and extending between said sides;

an electrical winding on said stator about said opening and including end turns extending generally axially from said sides;

a circumferentially coolant conduit in heat exchange relation with said end turns on the radially outer side thereof; and

a circumferential retainer radially outwardly of said conduit for holding said conduit in said heat exchange relation, said retainer having a coefficient of thermal expansion that is substantially less than the coefficients of thermal expansion of said conduit and said end turns.

4,797,589

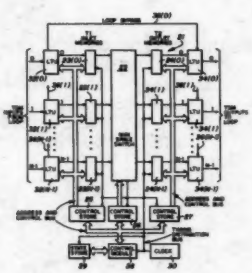
DYNAMICALLY RECONFIGURABLE TIME-SPACE-TIME DIGITAL SWITCH AND NETWORK

Arthur A. Collins, Dallas, Tex., assignor to Arthur A. Collins, Inc., Dallas, Tex.

Continuation of Ser. No. 825,394, Feb. 3, 1986, Pat. No. 4,701,907. This application Jul. 29, 1987, Ser. No. 79,252

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—63 3 Claims



1. A dynamically reconfigurable time-spacetime (DRTST) switching system for use in conjunction with a high speed transmission media which conveys a plurality of time division multiplex (TDM) channels within a repeated frame of data, comprising:

a bypass for selectively accessing said transmission media for extracting data from channels and inserting data into channels;

a control store connected to said bypass for receiving a variable number of dynamically selected channels from the plurality of channels, one or more of said selected channels comprising a control channel;

a time-space-time (TST) switch having a space switch including a plurality of inlet ports and a plurality of outlet ports each having a memory;

said bypass having a plurality of inlet line terminating units and a plurality of outlet line terminating units, said inlet line terminating units connected to receive selected channels from said transmission media for transferring data to said TST switch, said outlet line terminating units connected to transfer data from said TST switch to said transmission media;

said inlet line terminating units selectively passing ones of said channels to said TST switch and the remaining ones of said channels of said frame to said outlet line terminating units thereby selectively reducing the frame size of said transmission media transmitted to said TST switch, said outlet line terminating units restoring said reduced frame size to its oriqinal size;

said inlet ports of said TST switch being connected to randomly receive channels from said inlet line terminating units, said outlet ports of said TST switch being connected

to randomly transmit channels from said outlet ports to said outlet line terminating units for transferring data from said TST switch to said transmission media, ones of said inlet ports and outlet ports receiving frames of variable sizes determined by said control store; and

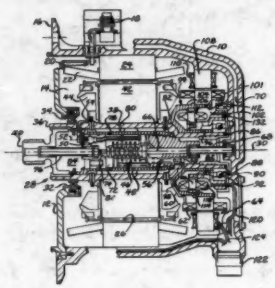
said control store responding to commands received through said control channels for dynamically allocating active ones of said selected channels to respective inlet ports of said TST switch, and for dynamically allocating received channels of said selected channels to active ones of said outlet ports of said TST switch and further for routing the data from said active ones of said selected channels through said TST switch to a selected active one of said outlet ports wherein said data for said active selected channel is returned to said transmission media to thereby accommodate various types of data.

4,797,590

BRUSHLESS GENERATOR WITH MINIMAL AXIAL LENGTH

Bernard A. Raad, and Edmund A. Schott, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 9, 1987, Ser. No. 117,951
Int. Cl.[4] H02K *19/26*
U.S. Cl. 310—68 D **14 Claims**



1. A brushless generator capable of manufacture with a relatively short axial length, comprising:

a stator having a rotor-receiving opening, an exciter field including a first ferromagnetic body and a permanent magnet generator output aramature including a second ferromagnetic body separate from said first ferromagnetic body; and a rotor journaled for rotation about an axis within said opening and including

(a) a main field winding,

(b) an exciter output winding,

(c) a rotating rectifier interconnecting said main field winding and said exciter output winding, and

(d) a permanent magnet generator field magnetically separate from said exciter output winding,

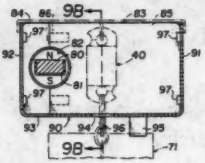
said exciter field being operatively associated with said exciter output winding and said permanent magnet generator output armature being operatively associated with said permanent magnet generator field and generally coplanar in a plane transverse to said axis and axially spaced from, but adjacent to, said main field.

4,797,591

LINK SUSPENSION FOR A ROTOR MEMBER

Edward C. Streeter, 89 Park Place, Harrogate, N. Yorkshire, England HG1 5NS

Continuation-in-part of Ser. No. 425,417, Sep. 28, 1982, Pat. No. 4,754,182. This application Nov. 5, 1986, Ser. No. 927,067
Int. Cl.[4] H02K *49/06*
U.S. Cl. 310—103 **4 Claims**



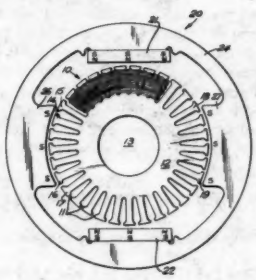
1. A link suspension permitting limited rotation of a rotor in response to a control torque, comprising a supporting member having an anticlastic supporting surface, a rotor having an anticlastic supported surface, torque coupling means fixed to said rotor, and a louver connected under tension to said rotor and holding said surfaces in contact, the radius of convexity along a transverse plane section of each of said surfaces being at least an order of magnitude smaller than the radius of concavity along a longitudinal plane section of the respective surface.

4,797,592

DYNAMO ELECTRIC MACHINE WITH UPWARDLY SHIFTED RIPPLE FREQUENCY

Thomas R. England, Blacksburg, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jun. 17, 1982, Ser. No. 389,481
Int. Cl.[4] H02K *23/06*
U.S. Cl. 310—154 **7 Claims**



1. In a rotary dynamo electric machine the combination of

a rotor including

winding slots,

armature windings located in said slots, and

commutating means connected to said windings;

a stator including

at least one permanent magnet providing a pole face with a nonuniform airgap relative to said rotor,

at least one pole face provided by a consequent pole, said pole face of said consequent pole spanning a distance on the surface off said rotor different from the integer slot distance, and means including said permanent magnet for generating magnetic flux at said pole faces; and

wherein said permanent magnet is in a block form providing

a flat pole face surface to provide said nonuniform airgap relative to said rotor.

4,797,593

CATHODE FOR ELECTRON TUBE

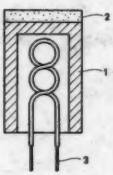
Masato Saito; Keiji Fukuyama; Masako Ishida; Keiji Watanabe, all of Kamakura; Toyokazu Kamata, and Kinjiro Sano, both of Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1986, Ser. No. 886,777

Claims priority, application Japan, Jul. 19, 1985, 60-160851; Oct. 14, 1985, 60-229304; Oct. 14, 1985, 60-229302; Oct. 14, 1985, 60-229303; Oct. 15, 1985, 60-231905; Oct. 15, 1985, 60-231906; Oct. 15, 1985, 60-231904; Jan. 18, 1986, 61-8365; Jan. 18, 1986, 61-6366; Feb. 19, 1986, 61-35670; Feb. 19, 1986, 61-35671; Feb. 25, 1986, 61-41050

Int. Cl.[4] H01J *1/02*

U.S. Cl. 313—346 R 30 Claims



1. An oxide-coated thermionic cathode for an electron tube, comprising:

a base comprising Ni as a major element, said base having a outer surface;

a reducing agent contained in said base;

only at least a portion of said outer surface of said base having coated thereon an electron-emisive substance comprising (a) an alkaline earth metal oxide as a principal component including barium oxide, and (b) 0.1 to 20 wt. % of at least one rare earth metal oxide selected from the group consisting of the oxides of Y, La, Ce, Pr, Nd, Sm, Gd, Sc, Dy, Ho, Er and Tm, and

a heater for heating said layer.

4,797,594

REPROGRAPHIC APERTURE LAMPS HAVING IMPROVED MAINTENANCE

A. Gary Sigai, Lexington, and Fred R. Taubner, Danvers, both of Mass., assignors to GTE Laboratories Incorporated, Waltham and GTE Products Corporation, Danvers, both of, Mass.

Continuation-in-part of Ser. No. 718,095, Apr. 3, 1985, Pat. No. 4,710,674, which is a continuation-in-part of Ser. No. 607,865, May 7, 1984, abandoned, and Ser. No. 607,846, May 7, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 929,694

Int. Cl.[4] H01J *61/44, 61/46*

U.S. Cl. 313—488 16 Claims

1. An aperture fluorescent reprographic lamp comprising:

an elongated envelope containing an ionizable medium including mercury and having electrodes at each end of said envelope;

a reflector layer on a major portion of the inner surface of said envelope;

a phosphor layer disposed upon said reflector layer within said envelope, said phosphor layer comprising particles of green-emitting zinc orthosilicate phosphor, said particles being individually coated with a non-particulate, conformal coating of aluminum oxide; and

a protective coating over at least the portion of the inner surface of said envelope not covered with said reflector layer.

4,797,595

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP HAVING A STRAIGHT EXHAUST TUBE FIXED ON A CONICAL STEM

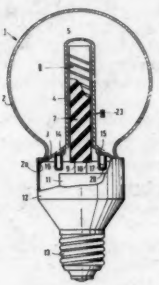
Henricus J. J. M. De Jong, Terneuzen, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 30, 1987, Ser. No. 68,660

Claims priority, application Netherlands, Jun. 30, 1986, 8601702

Int. Cl.[4] H01J *65/04*

U.S. Cl. 313—493 6 Claims



1. In an electrodeless low-pressure discharge lamp of the type having a discharge vessel defining a lamp axis comprising an outer envelope with an open end and a stem sealed in a gas tight manner to said outer envelope at said open end, said stem comprising a tubular section extending along said lamp axis within said outer envelope and a conical collar extending between the end of the tubular section near said open end and said open end, and means for generating a discharge within said discharge vessel during lamp operation, said means comprising a magnetic core accommodated within said tubular section, the improvement comprising:

said conical collar comprising a recess having a planar portion transverse to the lamp axis;

an exhaust tube parallel to said lamp axis having an end joined to said transverse portion; and

an orifice in said transverse portion positioned within the inner periphery of the exhaust tube for allowing communication between the exhaust tube and the interior space of the discharge vessel.

4,797,596

FILTER APPARATUS FOR A MAGNETRON

Mamoru Tsuzurahara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,214

Claims priority, application Japan, Sep. 8, 1986, 61-209489; Sep. 8, 1986, 61-209490

Int. Cl.[4] H01J *25/50*

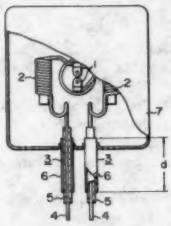
U.S. Cl. 315—5.13 8 Claims

1. A filter for reducing electromagnetic wave energy leakage from an electrode wiring of a magnetron, comprising:

(a) a cathode line for supplying a current to a cathode of the magnetron;

(b) an inductance element connected between said cathode and one end of said cathode line;

(c) capacitance means having a coaxial structure including a dielectric material surrounding said cathode line and a first conductor surrounding said dielectric material for imparting a capacitive parallel impedance as viewed from an electromagnetic wave source of said magnetron; and



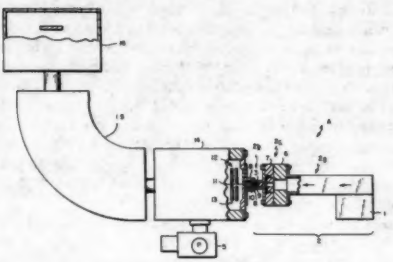
(d) high impedance means including a second conductor having a portion thereof connected to the first conductor of said capacitance means and surrounding the coaxial structure of said capacitance means to impart an inductive parallel high impedance as viewed from said electromagnetic wave source, said second conductor being in the shape of a cup and containing said capacitance means.

4,797,597

MICROWAVE ION SOURCE

Norman A. Bostrom, Rte. 2, Box 157-D, Georgetown, Tex. 78626

Filed Dec. 22, 1986, Ser. No. 944,026
Int. Cl.[4] H01J *27/00*
U.S. Cl. 315—39 **20 Claims**



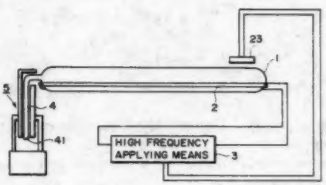
1. A microwave ion source comprising:
a microwave generator;
a waveguide comprising a first section to which said microwave generator is coupled for generating microwave radiation in said waveguide, a second section downstream of the first section in the direction of microwave propagation along the waveguide, and in which a discharge chamber is defined, and a transformer section beteween said first and second sections, said first and second sections having uniform rectangular internal cross-sectional shapes throughout the lengths of the respective sections, defined by a first dimension which is equal for both sections and is selected to at least approximate one half of the nominal wavelength of the microwaves produced at the rated operating frequency of the generator, and a lesser, second dimension which is smaller in said second section of the waveguide than in said first section, said transformer section being dimensioned to provide for transmission of microwaves from said first section to said second section substantially without impedance losses;
said transformer section including means between said first and second waveguide sections for providing a vacuum seal without impeding propagation of microwaves along the waveguide;
a liner of dielectric material within said second waveguide section defining said discharge chamber;
means for generating a magnetic field in the discharge chamber;
means for producing a vacuum in said chamber;
means for introducing a gaseous feed material into said chamber for forming a plasma; and,
means for extracting an ion beam from said chamber.

4,797,598

ILLUMINATION APPARATUS

Katsuya Oikawa, Yokohama; Hidemi Egami, Zama; Katuo Saitor, Yokohama, and Hiroshi Satomura, Hatogaya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 61,552
Claims priority, application Japan, Jun. 19, 1986, 61-143877; Jun. 19, 1986, 61-94003[U]; Mar. 3, 1987, 62-48080; Mar. 3, 1987, 62-48081; Mar. 3, 1987, 62-48082
Int. Cl.[4] H01J *65/09*; H05B *6/80*
U.S. Cl. 315—85 **17 Claims**



1. An illumination apparatus comprising:
a discharge tube for emitting light upon an application of a external high frequency wave electromagnetic field;
an electrode, arranged outside said discharge tube, for applying the high frequency wave electromagnetic field to said discharge tube;
high frequency wave applying means for supplying high frequency wave power to said electrode;
a projected portion extending from said discharge tube; and
a metal shielding member disposed between said projected portion and said discharge tube, said shielding member substantially shielding said projected portion from the high frequency wave electromagnetic field.

4,797,599

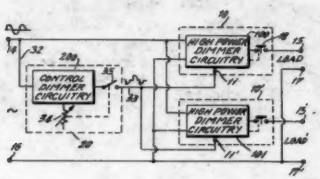
POWER CONTROL CIRCUIT WITH PHASE CONTROLLED SIGNAL INPUT

Jonathan H. Ference, Kintnersville; Steven M. Blonstein, Allentown; Michael J. Rowen, and Robert C. Newman, Jr., both of Emmaus, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 21, 1987, Ser. No. 40,618
Int. Cl.[4] H05B *41/29*
U.S. Cl. 315—194 **58 Claims**

1. A phase control circuit comprising, in combination:
a controllably conductive device having first and second main electrodes connectable in series with an a-c source and a load, and a control electrode;
an input circuit connected between said control electrode and one of said first and second main electrodes; and
a control signal source separate from said input circuit and connected to said input circuit, said control signal source generating a periodic phase controlled voltage wave shape in which each half-cycle has a sharply rising wave shape beginning at a delayed time in its respective period-

,and thereafter follows a generally sinusoidal shape to the end of its respective period; whereby said controllably



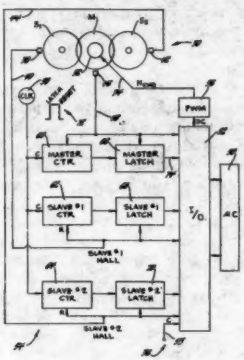
conductive device conducts to produce an output voltage wave shape across said load with a phase delay which is derived from the wave shape of said control signal source.

4,797,600

MAGNETIC DRIVE CONTROL SYSTEM FOR A MULTIPLE COOLING FAN INSTALLATION

Jack W. Savage, Centerville, and John R. Savage, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1987, Ser. No. 126,025
Int. Cl.[4] F16D *3/00*; H02P *6/02*
U.S. Cl. 318—254 14 Claims



1. A motor vehicle cooling fan drive apparatus comprising:

first and second juxtaposed and magnetically coupled rotary cooling fans;

drive means including an electric motor connected to rotatably drive said first cooling fan, and motor controller means connected to said electric motor for controlling its running speed in accordance with the value of a speed command signal applied thereto; and

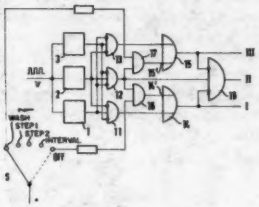
system control means including means for (1) generating a desired speed value for said fans in accordance with the vehicle cooling demand, (2) determining a phase error E_P according to the relative rotary positions of said first and second fans, (3) adjusting said desired speed value in a direction to reduce said phase error E_P at least when said phase error is greater than a threshold error, and (4) applying a speed command signal to said motor controller means in accordance with the adjusted speed value, thereby to control said electric motor for synchronously accelerating and running said first and second fans at said desired speed value.

4,797,601

ABUTMENT FORCE ADJUSTABLE WINDSHIELD WIPER ARRANGEMENT

Erich Ditzer, and Ludwig Hasenknopf, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,791
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628342
Int. Cl.[4] B60S *1/04*
U.S. Cl. 318—443 3 Claims



1. A windshield wiper arrangement for motor vehicles comprising:

a wiper arm resting on a surface to be cleaned with a variable abutment force dependent on vehicle velocity; and

control means for increasing the abutment force compared to the abutment force in effect with a standing-still motor vehicle and for rendering the abutment force smaller during non-wiper operation than during wiper operation and for rendering the abutment force larger during an additional washing operation than during the wiper operation;

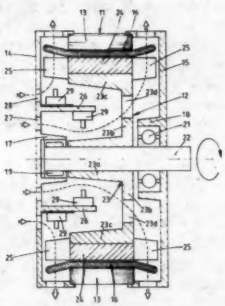
said control means increases the abutment force in two steps, the transition between the steps taking place during wiper operation as a function of the velocity, while during non-wiper operation always a lower base step of abutment force is engaged and during an additional washing operation always a higher maximum step of the abutment force is engaged.

4,797,602

DYNAMO ELECTRIC MACHINES

John G. W. West, Pershore, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 12, 1987, Ser. No. 13,706
Claims priority, application United Kingdom, Feb. 13, 1986, 8603590
Int. Cl.[4] F02N *11/04*; H02K *1/00, 21/12*
U.S. Cl. 322—10 7 Claims



1. A starter-generator comprising; a rotor assembly includ-

ing a plurality of circumferentially disposed rare earth-iron permanent magnets,

a stator assembly within which said rotor assembly in rotatable, said stator assembly including an annular stator body formed from a silicon containing iron alloy of high electrical resistivity and low magnetic loss, and a multiphase stator winding secured to an inner periphery of said stator body and lying in and airgap defined between the stator body and the rotor assembly,

a semiconductor inverter-rectifier assembly electrically connected with said multiphase stator winding for rectifying and controlling the output from the stator winding when acting in generator mode, and for switching the input to the winding when operating in motor mode, and,

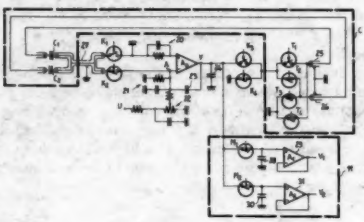
means associated with said semiconductor inverter-rectifier assembly whereby the angular position of the rotor assembly is determined for controlling switching of the electrical input to the stator winding to afford operation in motor mode.

4,797,603

DEVICE FOR MEASURING THE RATIO OF TWO LOW VALUE CAPACITIES

Joël Choisnet, Colombes, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 9, 1986, Ser. No. 883,765
Claims priority, application France, Jul. 9, 1985, 85 10481
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—60 CD **18 Claims**



1. A device for measuring a ratio between a first and a second capacity, comprising:

first and second switching means for selectively conducting a signal based on a control signal;

capacity switching means, including first means for receiving a first capacity, second means for receiving a second capacity, and third switching means, coupled to said first and second means, for selectively conducting a signal based on a control signal, said capacity switching means being coupled between said first and second switching means to separately and successively connect said first and second receiving means between said first and second switching means;

control means, coupled to said first and second switching means, for controlling said first and second switching means to be conducting in phase opposition to one another by supplying respective control signals thereto, and for controlling said third switching means to succesively and separately connect said first and second receiving means between said first and second switching means, said controlling being at a chopping frequency;

means for measuring a capacity ratio; and

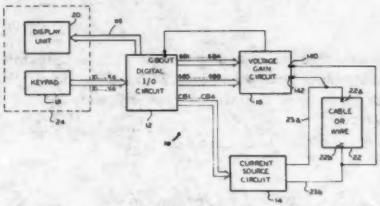
an integrator circuit, having an input connected to an output of said second switching means and to a D.C. voltage, and having an output connected to said capacity ratio measuring means and to an input of said first switching means.

4,797,604

WIRE LENGTH METER SUPPLING CURRENT TO A WIRE FROM WHICH A SIGNAL REPRESENTATIVE OF LENGTH IS DERIVED

Joseph A. Rocci, Palos Heights; John Crosetto, Bridgeview; Kent L. Earle, Woodridge, and David W. Kirby, Palos Heights, all of Ill., assignors to Etcon Corporation

Filed Dec. 9, 1987, Ser. No. 130,417
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—65 R **20 Claims**



1. An apparatus for determining the length of wires, said apparatus comprising:

connecting means for connecting across the ends of the wire whose length is to be determined;

current source means for selectively supplying different values of currents through the wire whose length is to be determined;

voltage gain means responsive to said different values of currents for selectively generating a plurality of different voltage levels for each of said different values of currents so as to provide an analog voltage signal having a predetermined range;

analog-to-digital converting means responsive to said analog voltage signal for converting the same to a first digital signal corresponding to a resistance of the wire;

storage means for storing data representative of resistance per unit length of various sizes of wires having a uniform cross-sectional area and for storing programmed instructions;

digital data processing means being responsive to the programmed instructions stored in said storage means for controlling the operation of said current source means, voltage gain means, and analog-to-digital converting means so as to generate said first digital signal;

said data processing means utilizing said first digital signal corresponding to the resistance of the wire and the data representative of resistance per unit length for generating a second digital signal representative of the length of the wire; and

display means responsive to said second digital signal for indicating the wire length.

4,797,605

MOISTURE SENSOR AND METHOD OF FABRICATION THEREOF

Ponnusamy Palanisamy, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

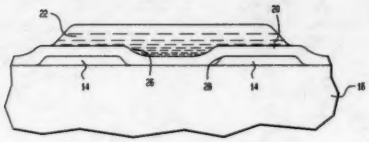
Filed Aug. 21, 1987, Ser. No. 87,826
Int. Cl.[4] G01N *27/07*; G01R *27/22*
U.S. Cl. 324—65 R **2 Claims**

1. A moisture sensor comprising:

a first layer of conductive material formed on a portion of a windshield to be wiped by windshield blades, said layer being patterned to provide a plurality of spaced apart electrodes; and

a second, continuous layer of a material having a higher resistivity than the material of said first layer overlying said first layer and the portions of said windshield exposed between the electrodes of said first layer wherein

said first and second layers each comprises a material including a powder of conductive metal oxide dispersed within



a glass matrix bonding said layers to each other and to said windshield.

4,797,606

MEASURING DEVICE FOR THE MEASUREMENT OF THE DEFORMABILITY OF RED BLOOD CORPUSCLES

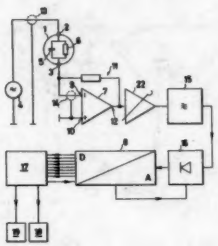
Helmut Jahn, Mainz, and Waldemar Karger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 876,165

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522186

Int. Cl.[4] G01N *27/02*

U.S. Cl. 324—71.1 5 Claims



1. A measuring device for the measurement of the deformability of red blood corpuscles, which device comprises a measurement chamber, which is subdivided by a foil into two chamber spaces, the foil having a passage opening with a diameter smaller than the diameter, at rest, of a red corpuscle, said chamber spaces being formed such that a static pressure gradient comes into existence between said chamber spaces creating a flow from one chamber space to the other, and at least one electrode being disposed on each of the two sides of said foil in the region of the passage opening, each respective electrode being connected to an alternating voltage source, and an operational amplifier, having an inverting input and a non-inverting input functioning as a current-measuring device, said operational amplifier further including regenerative coupling means for creating a fictitious ground potential at said inverting input, said operational amplifier being disposed in the connection between one of said electrodes and said alternating voltage source, said one electrode being connected to said inverting input of said operational amplifier thereby disposing said one electrode closer to ground than the other of said electrodes.

4,797,607

METHOD OF UPDATING THE SCALE FACTOR OF APPARATUS FOR MEASURING AN ALTERNATING ELECTRIC CURRENT BY MEANS OF THE FARADAY EFFECT

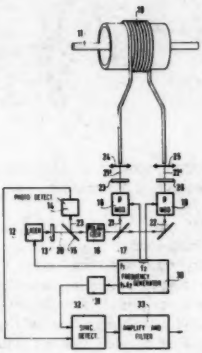
Jean-Pierre Dupraz, Aix les Bains, France, assignor to Alsthom, Cedex, France

Filed Apr. 11, 1988, Ser. No. 179,805

Claims priority, application France, Apr. 10, 1987, 87 05103

Int. Cl.[4] G01R *31/00*

U.S. Cl. 324—96 4 Claims



1. A method of updating the scale factor of a current measuring apparatus for measuring an alternating electrical current by means of the Faraday effect implemented in an interferometer which delivers an output light beam whose optical power includes a frequency spectrum component which is proportional, by a scale factor k2, to the sine or the cosine of the phase difference generated by the Faraday effect on the light waves travelling through the interferometer, said phase difference itself being proportional to the instantaneous value of the current to be measured as multiplied by a Faraday effect efficiency factor k1, said light beam being received by a photodetector and said component being extracted therefrom by associated electronics in order to constitute an output signal s(t) from the interferometer, said method consisting in:

determining the peak value I1 of the alternating current to be measured from the output signal s(t) from the interferometer, from the value k1 of the Faraday effect efficiency coefficient for the alternating current to be measured and the available value k2 of the scale factor;

causing two successive disturbances of different amplitudes by adding an auxiliary Faraday effect to the Faraday effect due to the alternating concurrent to be measured, said auxiliary Faraday effect being generated by a test drive current which successively takes on two distinct values I21 and I22 which are different from zero and which are applied with a Faraday effect efficiency factor k3;

storing the direct components so1 and so2 of the output signal from the interferometer in response to the above two disturbances; and

adopting a new scale factor k2 given by the expression:

$$(so1-so2)/(JO(k1.I1)[\sin(k3\ I21)-\sin(k3\ I22)])$$

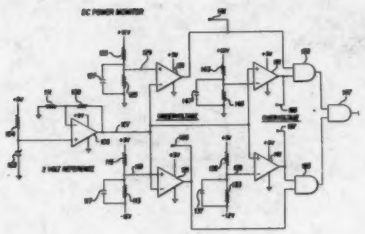
where JO is the zero order Bessel function of the first kind.

4,797,608

D.C. POWER MONITOR

Randall A. White, Plainville, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 85,095
Int. Cl.[4] G01R *19/165, 19/30*
U.S. Cl. 324—96 **9 Claims**



7. A method for monitoring at least first and second DC voltages being positive and negative voltages, respectively, comprising:

establishing a reference voltage level from a third voltage source, said third voltage source being a positive voltage;

coupling said first voltage to one end of a first and second means for dividing and coupling the other end to ground;

dividing the first voltage in the first dividing means to obtain a first divided voltage higher than said reference voltage;

comparing said first divided voltage with said reference voltage to provide a first output;

dividing said first voltage in the second dividing means to obtain a second divided voltage lower than said reference voltage;

comparing said second divided voltage with said reference voltage to provide a second output;

coupling said second voltage to one end of a third and fourth means for dividing and coupling the other end to the third voltage, whereby in each case positive voltages can be provided as inputs for comparing with the reference voltage;

dividing said second voltage in the third dividing means to obtain a third divided voltage lower than said reference voltage;

comparing said third divided voltage with said reference voltage to provide a third output;

dividing said second voltage in the fourth dividing means to obtain a fourth divided voltage higher than said reference voltage;

comparing said fourth divided voltage with said reference voltage to provide a fourth output;

Anding said first, second, third and fourth outputs to obtain a fifth output; and

energizing one color cathode of a two color LED if said fifth output is present and the other cathode if said fifth output is not present.

4,797,609

LED MONITORING WITHOUT EXTERNAL LIGHT DETECTION

J. Leon Yang, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 266,267, May 22, 1981. This application Dec. 12, 1983, Ser. No. 547,550
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 D **3 Claims**

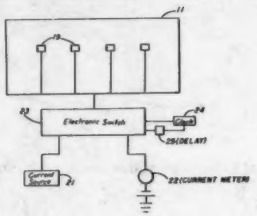
1. An apparatus for measuring the intensity of light in a plurality of identical light emitting diodes, comprising:

a source of current,

switch means for connecting said source of current to at least one of said plurality of identical light emitting diodes for the energization thereof,

a current measuring device, and

said switch means connecting said current measuring device



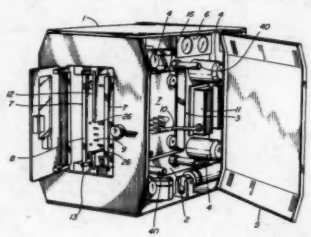
to an unenergized light emitting diode adjacent to said energized diode, said unenergized light emitting diode having a current induced therein linearly proportional to the intensity of light emitted by said energized light emitting diode.

4,797,610

ELECTRONIC TEST FIXTURE

Miguel Fombellida, 905-371 Gilmour St., Ottawa, Canada K2P 0R1

Filed May 8, 1986, Ser. No. 860,891
Int. Cl.[4] G01R *31/02, 31/28*
U.S. Cl. 324—158 F **16 Claims**



1. An electronic test fixturing apparatus for testing a generally planar circuit board having two reference holes pierced transversely therethrough comprising:

(1) circuit board support means within said apparatus, said support means being provided with first and second guide means adapted to receive and maintain said circuit board in a position between said guide means, said circuit board being biased to rest normally on said first guide means, but being loosely constrained and displaceable towards second guide means;

(2) a pair of probe plates, each member of said pair being mounted on opposed sides of said circuit board when said circuit board is installed upon said support means, said plates carrying, collectively, a pair of inwardly directed parallel index pins and complementary index pin receiving holes; and

(3) end positioning means adapted to approximately align said circuit board upon insertion on said support means so that said index pins are opposite said reference holes,

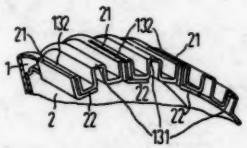
wherein said index pins are targeted, under conditions of perfect alignment, within the central region of the upper half of said reference holes furthermost from said first guide means.

4,797,611

BIPARTITE GENERATOR WHEEL FOR AN ANGULAR PULSE GENERATOR

Hans Schreiber, Lappersdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1987, Ser. No. 68,925
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622214
Int. Cl.[4] G01B 7/30
U.S. Cl. 324—208 3 Claims



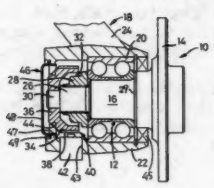
1. A generator wheel for an angular pulse generator, having a rotational axis comprising:
- a sheet metal tooth part having a central region and a toothed edge formed at a circumferential region coaxial to said rotational axis and having a plurality of teeth of which n teeth are fashioned as marker teeth, said marker teeth each including a recess; and
- a marker part connected to said tooth part and having marker members being sheet metal strips formed as an integral part of said marker part, said strips projecting into said recess of said marker teeth, said teeth and said marker members being composed of materials having different eddy current losses.

4,797,612

DEVICE FOR DETECTING ROTATING SPEED OF VEHICLE WHEEL

Nobuyasu Nakanishi; Noboru Noguchi; Hideyuki Aizawa, and Kenzi Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 6, 1987, Ser. No. 69,900
Claims priority, application Japan, Jul. 8, 1986, 61-104529[U]
Int. Cl.[4] G01P 3/48
U.S. Cl. 324—173 19 Claims



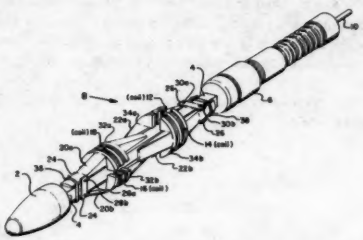
1. A device for detecting a rotating speed of a wheel of a vehicle, comprising:
- an axle hub including a shaft portion, and a flange portion which extends radially outwardly from one of opposite axial ends of said shaft portion and which supports said wheel, said shaft portion having an intermediate section at which said axle hub is rotatably supported by a bearing device supported by a stationary member, said shaft portion further having a free end section which extends axially from said intermediate section in a direction away from said flange portion;
- a rotor secured to said free end section of said shaft portion such that said intermediate section and said bearing device are interposed between said rotor and said flange portion axially of said axle hub, so that said rotor is rotatable with said wheel and accessible without moving said bearing device, said rotor including an externally toothed section which has a multiplicity of teeth spaced apart from each other in a circumferential direction of the rotor;
- a detector supported by said stationary member, and operable to detect said teeth of said externally toothed section of said rotor while said rotor is rotated; and
- a covering attached to said stationary member, and cooperating with said stationary member to cover said rotor.

4,797,613

EXPANDABLE EDDY CURRENT PROBE FOR INSPECTING THE INTERIOR OF TUBULAR CONDUITS

Timothy H. Wentzell, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 22, 1985, Ser. No. 693,427
Int. Cl.[4] G01N 27/72, 27/82; G01R 33/12
U.S. Cl. 324—220 2 Claims



1. A probe for longitudinally traversing the interior of an elongated, variable inner diameter installed steam generator tube, comprising:
- a central rod, opposing guide arms, each guide arm mounted on a pivot oriented transversely to the central rod at a fixed point intermediate the ends of the guide arm and each guide arm further including,
- a tube engaging guide arm free end configured to fit closely against a portion of the interior tube surface and an opposite guide arm lever end extending from the pivot point in a direction opposite the tube engaging end and terminating in a spaced apart relationship with the central rod;
- electrical sensor means disposed within the tube engaging free end, for detecting flaws in the tube wall currently adjacent the tube engaging end;
- compression means acting radially inwardly on the opposite guide arm lever end of each of the guide arms for urging the tube engaging free end of the opposing guide arms outward from the central rod into supportive contact with the interior of said tube; and
- means for selectively moving the probe longitudinally through said installed steam generator tube.

4,797,614

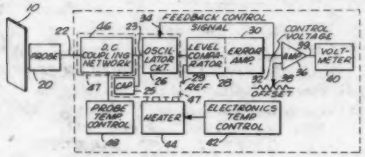
APPARATUS AND METHOD FOR MEASURING CONDUCTANCE INCLUDING A TEMPERATURE CONTROLLED RESONANT TANK CIRCUIT WITH SHIELDING

Roger E. Nelson, Northridge, Calif., assignor to Sierracin Corporation, Sylmar, Calif.

Continuation of Ser. No. 667,537, Dec. 3, 1984, abandoned. This application Apr. 20, 1987, Ser. No. 45,244
Int. Cl.[4] G01R 27/00; G01N 27/72; H03B 1/00; H01F 15/04
U.S. Cl. 324—236 11 Claims

3. Apparatus for measuring conductance of a sample comprising:
- (a) a resonant tank circuit having a tank coil for loading by the sample, the tank coil having an axis;

(b) means for positioning the tank coil in a predetermined relation to the sample;
(c) an oscillator incorporating the tank circuit;
(d) a control circuit for the oscillator responsive to the loading of the tank coil by the sample, the control circuit stabilizing the amplitude of oscillation of the oscillator and producing a control signal proportional to the loading;



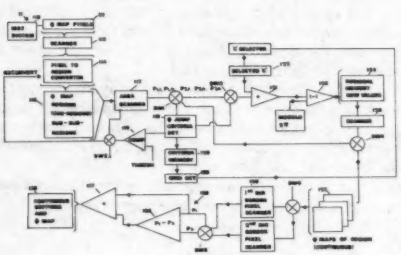
(e) means for controlling the temperature of the tank coil by coupling a variable direct current into the tank coil, the direct current varying in response to a circuit for measuring the resistance of the tank coil so that the direct current is reduced when the resistance of the tank coil increases; and
(f) means responsive to the control signal for indicating the conductance.

4,797,615

DETERMINING AND CORRECTING FOR PHASE JUMPS

Haim Rotem, Moshav Rishpon; Yair Shimoni, Jerusalem, and Shmuel Goldberg, Tel Tsur, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Sep. 30, 1987, Ser. No. 103,012
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**



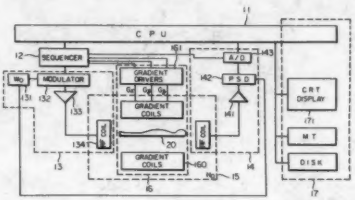
1. A method of providing a continuous magnetic field map for magnetic resonance systems, said method including the steps of:
acquiring a phase image comprising a plurality of elements corresponding to pixels,
dividing the phase image into a plurality of subimages each comprising a plurality of said elements wherein the sizes of the subimages are sufficiently small to limit the phase spread of each of the subimages to being no more than 2π, and
phase unwrapping in each subimage by adding a selected modulo 2π constant to each element of the subimage to provide said continuous map of the magnetic field.

4,797,616

HIGH SPEED NMR SPECTROSCOPIC IMAGING METHOD

Shigeru Matsui, El Cerrito, Calif.; Takashi Onodera, Koganei, Japan; Kensuke Sekihara, Hachioji, Japan; Hidemi Shiono, Akigawa, Japan, and Hideki Kohno, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,901
Claims priority, application Japan, Feb. 4, 1987, 62-22310
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**



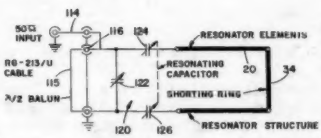
1. A high speed spectroscopic imaging method comprising:
a first step of preparing a transversal magnetization signal of an object placed in a homogeneous static magnetic field;
a second step of applying a field gradient in a specified direction in a specified plane of said object to translate a position of the signal in a phase domain from the origin of a K-space;
a third step of sampling the signal while rotating a position of the signal in the K-space plural times on a given circle with the center thereof at the origin of the K-space by applying a field gradient with its direction continuously rotating in said specified plane; and
a fourth step of performing respective Fourier transformations for plural data trains each of which is composed of data present at the same position on the K-space in a group of data obtained at said third step, thereby effecting a spectral analysis of the signal.

4,797,617

NUCLEAR MAGNETIC RESONANCE RADIO FREQUENCY ANTENNA

George J. Misic, Hiram; Aarne Lillo, North Royalton; John L. Patrick, Solon, and G. Neil Holland, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation of Ser. No. 641,570, Aug. 16, 1984, Pat. No. 4,634,980. This application Nov. 21, 1986, Ser. No. 933,152
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **13 Claims**



1. A RF coil for an NMR device, the coil being tuneable to at least one resonant frequency and comprising:
at least two active sections, the active sections all being substantially parallel to an axis, each active section having a drive end and a ground end that is connected to a common potential, each drive end being situated in a first region and each ground end being situated in a second region, the first and second regions being spaced from each other along the axis, each active section comprising

at least one conductive element extending between the drive end and the ground end; and,

a connecting circuit connected between the drive ends of the active sections, each active section being coupled by the connecting circuit to at least one of the other active sections, the connecting circuit maintaining a phase difference of approximately one half wavelength between the drive ends of two of the active elements at a tuned resonant frequency.

4,797,618

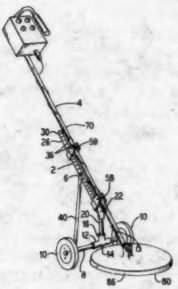
CADDY FOR METAL DETECTOR

Charles V. De Vries, 16203 Serenity St., Plainfield, Ill. 60544

Filed Feb. 11, 1987, Ser. No. 13,476

Int. Cl.[4] G01V *3/11, 3/165;* B62B *1/00*

U.S. Cl. 324—326 **18 Claims**



9. A caddy for metal detectors of the type having an elongated stem with a handle at one end for holding by a user and having a searchcoil head at the opposite end extending angularly from the elongated stem to be positioned substantially parallel to the surface of the ground when the elongated stem is held at a diagonal to the ground, wherein said caddy includes a supporting frame including an elongated connecting member with adjustable attachment means for connection to said elongated stem of said metal detector to support said elongated stem of said metal detector at a diagonal to the ground and said searchcoil head positioned substantially parallel to and above the surface of the ground, transport means to move said caddy and metal detector supported thereon across the ground, an extension member extending from said elongated connecting member at an oblique angle to said transport means for connection thereto, said transport means including an axle, said extension member being connected to said axle, and a wheel mounted on each opposite end of said axle and said attachment means mounted on said connecting member being adjustable to adjust the height of said searchcoil head above the surface of the ground to a pre-selected height.

4,797,619

METHOD AND APPARATUS FOR MEASURING SPATIAL PROFILES OF ENERGY BEAMS

Richard L. Austin, Del Mar; Herbert J. Otto, and Frank L. Jones, both of San Diego, all of Calif., assignors to EG&G Gamma Scientific Incorporated, San Diego, Calif.

Filed Mar. 13, 1987, Ser. No. 25,897

Int. Cl.[4] G01R *31/24*

U.S. Cl. 324—409 **37 Claims**

1. An apparatus for measuring spatial profiles of energy beams, comprising:

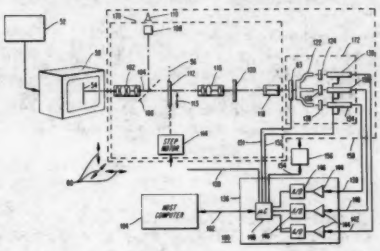
means for generating a radiant energy image representative of the energy intensity of a cross section of a beam to be measured;

detector means for measuring the intensity of the radiant energy of said image;

means for supplying the radiant energy of said image along an optical path to said detector means;

a knife edge aperture positioned in said optical path between said generating means and said detector means;

means for transversely moving said knife edge aperture across said optical path; and



processor means connected to said detector means and said moving means for obtaining the integral of said detector means output with respect to the position of said knife edge aperture and for generating an output representative of the spatial characteristics of said beams from said integral.

4,797,620

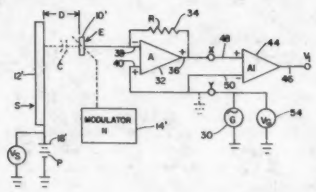
HIGH VOLTAGE ELECTROSTATIC SURFACE POTENTIAL MONITORING SYSTEM USING LOW VOLTAGE A.C. FEEDBACK

Bruce T. Williams, 454 South St., Lockport, N.Y. 14094

Filed Aug. 20, 1986, Ser. No. 898,115

Int. Cl.[4] G01R *29/12*

U.S. Cl. 324—458 **32 Claims**



1. A non-contacting electrostatic detector comprising:

(a) a detector electrode sensitive to electrostatic quantities such as electrostatic fields, voltages and charges;

(b) means operatively associated with said electrode for varying the capacitive coupling between said electrode and a surface bearing an electrostatic quantity to which said electrode is exposed;

(c) an amplifier having first and second inputs and an output, said first input functioning as a summing node;

(d) means for connecting said electrode to said first input of said amplifier;

(e) said amplifier being connected as a summing amplifier by impedance means connected between said output and said first input in a manner not allowing the voltage from said electrode and appearing in said amplifier to change due to change in capacitance between said electrode and said surface;

(f) said means for varying the capacitive coupling causing a first current to flow through said impedance means in the form of a capacitance displacement current flowing through the capacitance between said electrode and said surface due to the voltage between said electrode and said

surface and the change in the capacitance between said electrode and said surface; and

(g) means for applying to said second input of said amplifier a sinusoidal voltage signal having a frequency equal to that of said capacitance varying means and having an amplitude and phase producing a second current in the capacitance between said electrode and said surface having a magnitude and phase to cancel said first current so that the ratio between the change in amplitude of said sinusoidal voltage and the magnitude of the electrostatic quantity on said surface is fixed by the ratio of the capacitance between said electrode and said surface and the change in said capacitance;

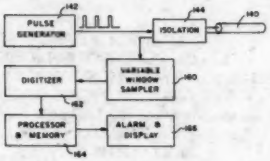
(h) whereby the amplitude and phase of said sinisoidal voltage provides information as to the magnitude and polarity of said electrostatic quantity.

4,797,621

LEAK DETECTOR AND LOCATOR UTILIZING TIME DOMAIN REFLECTOMETRY AND SAMPLING TECHNIQUES

Arthur L. Anderson, Kokomo, Ind.; Douglas S. Bailey, Deerfield, and Richard J. Korinek, Aurora, both of Ill., assignors to Midwesco, Inc., Niles, Ill.

Filed Jul. 8, 1987, Ser. No. 71,022
Int. Cl.[4] G01M *3/18*
U.S. Cl. 324—533 **31 Claims**



1. A detector for detecting fluid in a predetermined area comprising:

an electric cable adapted to be disposed in said predetermined area;

means for applying pulses to said cable;

means coupled to said cable for receiving reflections of said pulses from said cable;

means for sampling said reflections, said sampling means being operative to sample a plurality of reflections and to take only one sample of each reflection subsequent to the application of each pulse to said cable, each sample being shifted in time by a different amount with respect to the last applied pulse and corresponding to a different portion of the reflection;

means for storing said samples to provide a stored representation of a reflection; and

means coupled to said sampling means for comparing samples of subsequent reflections with said stored samples and providing an indication of the presence of a fluid if samples of subsequent reflections differ from said stored samples by a predetermined amount.

4,797,622

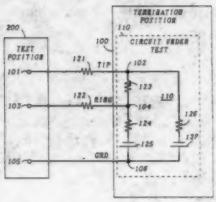
TECHNIQUE FOR DETERMINING THE VALUES OF CIRCUIT ELEMENTS IN A THREE TERMINAL EQUIVALENT CIRCUIT

Chia-Lung Lin, Matawan, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 1, 1987, Ser. No. 33,445
Int. Cl.[4] G01R *31/08*; H04M *3/44*
U.S. Cl. 324—537 **20 Claims**

1. Apparatus for determining the electrical values of circuit elements in a three terminal equivalent circuit, said equivalent circuit being representative of an actual communications network, said apparatus comprising

means for applying predetermined signals to said actual communications network and measuring the electrical effects in response thereto;



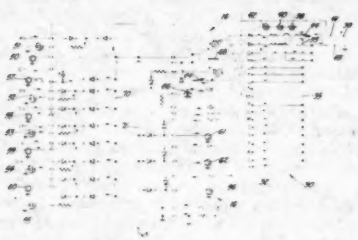
means for forming at least one ratio, the numerator and denominator of each ratio being a different function of at least one of said measured effects and each ratio being representative of the value of one preselected circuit element to another in said equivalent circuit; and

means for determining the electrical values of said circuit elements in response to at least one of said formed ratios.

4,797,623

TESTER FOR FIRE-SUPPRESION COMPONENTRY

Steven L. Hoffman, Macomb, and Robert L. Rammage, Wayne, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1987, Ser. No. 39,186
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—556 **1 Claim**

1. A method to check electrical continuity in a control panel and in a cable connecting the control panel to fire supression system components of a military vehicle, wherein access to the panel is limited and obstructed by surrounding vehicle elements, wherein the panel has first panel lines for sending power to the components, second panel lines for receiving current from the components, a third panel line for receiving electrical current from an electrical power source, panel lights in grounded end segments of the second and third panel lines for indicating receipt of current in the second and third panel lines, a light checking circuit connecting the panel lights in parallel, means to prevent current in the grounded end segments from entering the remaining portions of the second and third panel lines, a panel switch connected to the third panel line having a ilrst position to energize the light checking circuit and a second position to energize the first panel lines, and wherein the cable has first cable lines for connecting the first panel lines to the components and has second cable lines for connecting the components and a power source to the second panel lines, the method comprising:

providing a test mechanism having a source of electrical power independent of the source of electrical power for

the panel, a pair of terminal lines for detachably connecting the test mechanism to the independant source of electrical power, first test lines corresponding to respective first panel lines, test lights in the first test lines, second test lines corresponding to respective second panel lines, a test switch having one position for connecting the independent power source to the light checking circuit and another position for simultaneously connecting the independent source of electrical power to all the second test lines, the test mechanism being shaped as a tube no greater than about five inches in length;

attaching the test mechanism to the panel so that the first test lines connect with the respective first lines of the panel and the second test lines connect with respective second lines of the panel;

placing the panel switch in the first position wherein the light checking circuit is tested;

placing the test switch in the one position and then detecting which panel lights illuminate;

placing the panel switch in the second position to energize the first panel lines;

moving the test switch from the one position to the other position, thereby de-energizing the light checking circuit and sending current to all the second panel lines, and then detecting which panel lights are illuminated;

removing the test mechanism from the panel;

attaching the cable to the panel so that the second cable lines connect with the second panel lines;

disconnecting the terminal lines of the test mechanism from the independant power source and then connecting the ends of the terminal lines together;

attaching the test mechanism to the free end of the cable and disconnecting the terminal lines of the test mechanism from the independant power source, the first test lines of the test mechanism being connected in series with respective first cable lines and first panel lines;

detect which of the test lights is illuminated;

detect which of the panel lights is illuminated.

4,797,624

METHOD AND APPARATUS FOR EDITING PARTICLE PRODUCED ELECTRICAL PULSES

Harvey J. Dunstan, Wheathampstead; John G. Harfield, Harlington; Paul Knight, and Harvey J. Podgorney, both of Luton, all of England, assignors to Coulter Electronics, Ltd., Luton, England

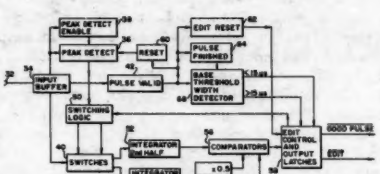
PCT No. PCT/US86/01197, § 371 Date Jan. 29, 1987, § 102(e) Date Jan. 29, 1987, PCT Pub. No. WO86/07218, PCT Pub. Date Dec. 4, 1986

PCT Filed May 30, 1986, Ser. No. 44,530

Claims priority, application United Kingdom, May 31, 1985, 8513809

Int. Cl.[4] H03K *5/22, 5/00*

U.S. Cl. 328—114 **19 Claims**



1. A method for editing particle produced electrical pulses, said method comprising the steps of: determining the symmetry of each pulse, comparing said symmetry with respect to acceptable limits thereof, and editing each pulse which lies outside of the acceptable symmetry limits.

4,797,625

DEVICE FOR DETECTING BIT PHASE DIFFERENCE

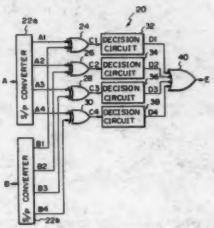
Satoshi Nakazawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 22, 1987, Ser. No. 99,540

Claims priority, application Japan, Sep. 25, 1986, 61-226670; Jan. 14, 1987, 62-7815

Int. Cl.[4] H03K *9/06*; H03D *13/00*

U.S. Cl. 328—133 **6 Claims**



1. A device for detecting a difference in bit phase between two identical data sequences A and B each being transmitted over a respective one of two transmission paths, comprising:

means for serial-to-parallel converting the data sequences A and B into respective bit sequences A_1 to A_m and B_1 to B_m where M is a positive integer equal to a predetermined common measure of a frame period of the data sequences A and B;

M bit phase detecting means for detecting respective phase differences between corresponding ones of the bit sequences A_1 to A_m and B_1 to B_m, such corresponding being with respect to order; and

means to determine the bit phase difference between the data sequences A and B responsive to respective outputs from said M bit phase detecting means.

4,797,626

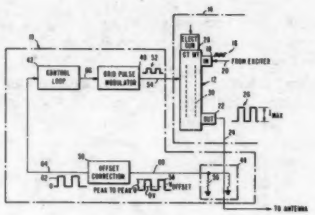
OFFSET VOLTAGE CORRECTION CIRCUIT FOR GRIDDED POWER TUBES

Hiroshi Honda, Garden Grove, Calif., and Eduardo D. Szyszlican, Lanus O., Argentina, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 29, 1986, Ser. No. 902,270

Int. Cl.[4] H03K *3/02*; H01J *19/82*

U.S. Cl. 328—225 **10 Claims**



1. An electronic, voltage-offset correcting circuit for a gridded power tube having a pulsed output current, the correcting circuit comprising:

(a) means responsive to the pulsed output current of the power tube for providing a pulsed, offset voltage signal proportional to said output current said offset voltage signal being offset from a zero voltage reference by between about zero percent and about 50 percent of the

peak-to-peak voltage of the offset voltage signal, the percentage of the voltage offset varying according to operating conditions of the power tube;

(b) voltage offset correcting means for receiving the offset voltage signal and responsive thereto for providing a pulsed, corrected voltage signal having substantially no voltage offset from said zero reference; and

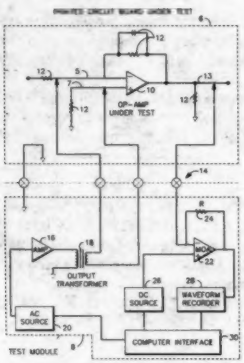
(c) means for receiving the corrected voltage signal and responsive thereto for providing to the tube grid a pulsed grid voltage which causes the pulsed output current of the tube to have a predetetmined value.

4,797,627

PROGRAMMATICALLY GENERATED IN-CIRCUIT TEST FOR GENERAL PURPOSE OPERATIONAL AMPLIFIERS

Wayne R. Chism, Greeley, and Larry G. Smeins, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1988, Ser. No. 175,831
Int. Cl.[4] G01R *27/00*
U.S. Cl. 330—2 **11 Claims**



1. A module for programmatically testing an operational amplifier that is connected to components in a circuit comprising:

alternating current voltage means for generating a precision alternating current signal for isolation and stimulation of said operation amplifier;

transformer coupled drive amplifier means for coupling said alternating current voltage means to said operational amplifier;

direct current voltage means for generating precision direct current signal;

measuring operational amplifier means with feedback resistor for clamping output voltage of said operational amplifier and converting output current of said op-amp to a voltage;

waveform recorder means for recording said output voltage of said operational amplifier

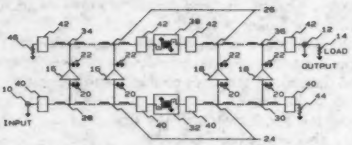
comparator means for comparing said recorded output with expected results to provide an indication of functionality of said operational amplifier.

4,797,628

DISTRIBUTED PUSH-PULL AMPLIFIER

Michael E. Gruchalla, 4816 Palo Duro, NE, Albuquerque, N. Mex. 87110, and David C. Koller, 4522 Idlewilde Ln. SE, Albuquerque, N. Mex. 87108

Filed Mar. 23, 1988, Ser. No. 173,062
Int. Cl.[4] H03F *3/60, 3/28*
U.S. Cl. 330—54 **14 Claims**



1. A distributed amplifier system comprising:

a. at least one input line;

b. an output line;

c. at least two amplifying means; and

d. at least one output signal inverting means

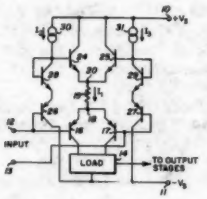
wherein an input terminal of each said amplifying means is connected to said input line, and an output terminal of each said amplifying means is connected to said output line, and said output signal inverting means is interconnected into said output line between at least one pair of adjacent said amplifying means.

4,797,629

WIDE RANGE OPERATIONAL AMPLIFIER INPUT STAGE

Robert J. Widlar, Puerto Vallarta, Mexico, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 3, 1988, Ser. No. 163,573
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—258 **11 Claims**



1. A differential amplifier input stage having differential signal input terminals, said stage being operative over a wide range of input signal potentials and connectable to positive and negative power supply terminals, said circuit comprising:

first and second input transistor means, each one including collector, base and emitter electrodes;

means for coupling said input transistor base electrodes to said signal input terminals;

means for coupling said collector electrodes to a common load circuit for responding to the differential collector currents in said first and second input transistor means;

means for coupling said emitters of said first and second input transistor means together and to the first end of a series resistor, the other end of which is coupled to a tail current supply;

a first current amplifier having an input coupled to said base of said first transistor means and an output coupled to said other end of said series resistor; and

a second current amplifier having an input coupled to said

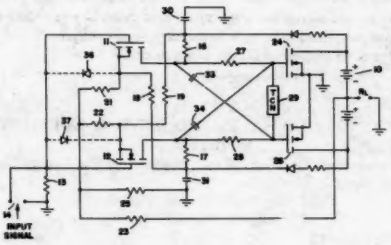
base of said second transistor means and an output coupled to said other end of said series resistor.

4,797,630

TWO STAGE PUSH-PULL MOSFET POWER AMPLIFIER

Albert W. Brown, 622 Commercial Ave., #4, S. San Francisco, Calif. 94080

Filed Apr. 1, 1986, Ser. No. 846,951
Int. Cl.[4] H03F 3/30
U.S. Cl. 330—264 **12 Claims**



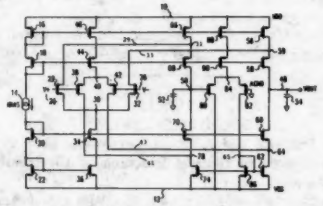
10. A power amplifier, comprising; an output stage including a first pair of complementary MOSFET power transistors connected in push-pull fashion, a second pair of complementary MOSFET driver transistors connected in push-pull fashion, means for conducting a signal to said second pair of transistors, first signal path means extending from the drain of each of said driver transistors to the gate of an associated one of said power transistors, power supply means for biasing said first and second pair of transistors so that as each driver transistor is driven toward conduction by said signal the associated power transistor is driven toward non-conduction, and cross-signal path means extending from the drain of each of said driver transistors to the gate of the non-associated power transistor.

4,797,631

FOLDED CASCODE AMPLIFIER WITH RAIL-TO-RAIL COMMON-MODE RANGE

Wei-Chan Hsu, Plano; William R. Krenik, Dallas, and James R. Hellums, Arlington, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1987, Ser. No. 124,694
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—253 **13 Claims**



1. A folded cascode differential amplifier with rail-to-rail common-node range, comprising:

a positive supply rail;

a negative supply rail;

first common source circuitry for converting a differential input voltage to a first differential current and operable to said positive rail;

second common source circuitry for converting said input voltage to a second differential current and operable with a common-node range to said negative rail;

a plurality of first push-pull cascade devices for receiving on an input one side of each of said first and second differential currents for conversion to a voltage on a first output node;

a plurality of second push-pull cascode devices for receiving on an input one side of each of said first and second differential currents for conversion to a voltage on a second output node;

a first current variable load for varying the current through said first ascode devices to vary the voltage on said first output node;

a second current variable load for varying the current through said second cascode devices to vary the voltage on said second output node; and

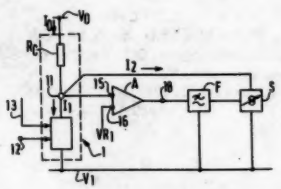
a negative-feedback auxiliary amplifier coupled to said cascode devices and said current variable loads, said auxiliary amplifier operable to maintain said cascode devices in linear operation while permitting variations in load current resulting from rail-to-rail common mode operation.

4,797,632

VARIABLE GAIN AMPLIFIER CIRCUIT AND ITS USE IN AN AUTOMATIC GAIN CONTROL ARRANGEMENT

Alain Guery, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1987, Ser. No. 112,869
Claims priority, application France, Nov. 18, 1986, 8615994
Int. Cl.[4] H03G 3/30
U.S. Cl. 330—285 **7 Claims**



1. An amplifier circuit comprising an input stage including an active element connected in series with a load resistor between first and second points of D.C. reference potential, said active element having a signal input terminal and a gain control adapted to be varied by varying the operating point of said active element for producing on an active terminal of said load resistor an amplified output signal which has a D.C. component which may vary in level with changes in said operating point; and

means for stabilizing the level of the D.C. component of said output signal comprising

a variable D.C. current generator for generating and applying to the active terminal of said load resistor a current in opposition to the average output current of said input stage of a value such that the sum of the currents passing through said load resistor is constant,

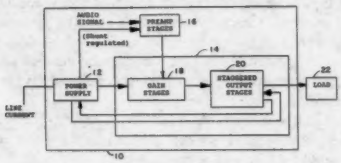
a high-gain differential amplifier having a first input connected to said active terminal of said load resistor, a second input connected to a third point of reference potential, and an output terminal, and

a low-pass filter connected to receive a signal from the output terminal of said differential amplifier and supplying a signal for controlling said D.C. current generator in a way such that the current generated by said generator is applied as negative feed-back to the first input of said differential amplifier.

4,797,633
AUDIO AMPLIFIER

Theodore J. Humphrey, Los Angeles, Calif., assignor to Video Sound, Inc., Boulder City, Nev.

Filed Mar. 20, 1987, Ser. No. 28,551
Int. Cl.[4] H03F 3/04
U.S. Cl. 330—297 16 Claims

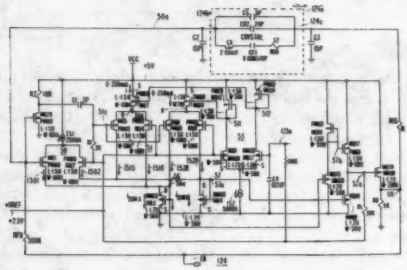


1. An audio amplifier comprising:
a power supply for supplying a direct current voltage;
an amplifier circuit coupled to the power supply to receive the direct current voltage, the amplifier circuit having an input for receiving a signal and an output stage, the output stage for coupling the amplifier to an audio transducer, the amplifier circuit drawing power from the power supply;
means for sensing the power drawn from the power supply and means for reducing the available voltage provided by the power supply to the amplifier circuit in an inverse relationship to the power drawn from the power supply;
whereby the power supply is collapsible, in that the voltage rails available to drive the output stage is limited by the output power drawn to enable the generation of an efficient audio output signal minimizing the effects of clipping distortion.

4,797,634
CONTROLLED OSCILLATOR

Paul D. Filliman, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Aug. 31, 1987, Ser. No. 91,167
Int. Cl.[4] H03L 7/00
U.S. Cl. 331—12 21 Claims

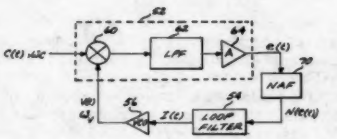


1. A stereo decoder apparatus responsive to a baseband composite audio signal that includes a pilot signal component, comprising:
a controllable oscillator responsive to a control signal, said oscillator generating an oscillatory output signal at a frequency that is controlled in accordance with said control signal, said controllable oscillator including:
a differential, first amplifier for generating first and second output signals that are opposing in phase;
a second amplifier for generating a third output signal, at least one of said amplifiers being responsive to said control signal for varying an amplitude of one of said first, second and third output signals when said control signal varies;
a resonator responsive to said oscillatory output signal for generating at an output terminal thereof a second oscillatory signal that is coupled to said first and second amplifiers, said resonator having a frequency response that determines a range of frequencies from which said frequency of said oscillatory signal can be selected;
reactive means coupled to said second oscillatory signal and to one of said amplifiers for providing a phase shift to one of said first, second and third output signals relative to at least another one of said first, second and third output signals;
combining means for combining said first, second and third output signals for generating said oscillatory output signal; and
means responsive to said pilot signal component and to said oscillator signal for generating said control signal to vary said amplitude for synchronizing said oscillatory output signal to said pilot signal component.

4,797,635
TRACKING LOOP HAVING NONLINEAR AMPLITUDE FILTER

G. Stephen Hatcher, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 11, 1987, Ser. No. 48,635
Int. Cl.[4] H03L 7/06
U.S. Cl. 331—17 9 Claims



1. A tracking loop for receiving a periodic carrier signal and for producing an output signal that is phase locked to the carrier signal, the tracking loop comprising:
an oscillator having an input terminal, an output terminal, and means for producing the output signal at the output terminal at a frequency that is a function of an input signal applied to the input terminal;
a phase detector connected to receive the carrier signal and the output signal, and to produce an error signal e having a magnitude that is a function of the product of the carrier and output signal amplitudes and of the phase difference between the carrier and output signals;
a nonlinear amplitude filter connected to receive the error signal e and to produce a modified error signal N such that N is an odd function of e, such that the derivative of N with respect to e is a constant k for comparatively small values of e, and such that the magnitude of N is greater than the product of k times the magnitude of e for relatively large values of e; and
a loop filter for receiving the modified error signal and for producing the input signal.

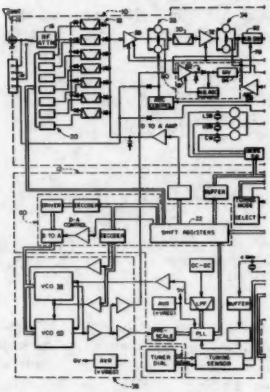
4,797,636
RADIO RECEIVER

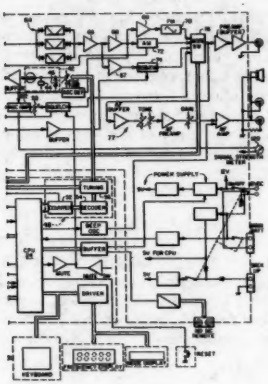
Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Division of Ser. No. 661,025, Oct. 15, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 853,846
Int. Cl.[4] H03B 21/02
U.S. Cl. 331—48 5 Claims

1. A tuning system for a radio receiver comprising: first local oscillator means for producing first local oscillator signals at frequencies over a first predetermined range of frequencies; said first local oscillator means being responsive to first predetermined oscillator control signals for varying the frequency of said first local oscillator signals over said first predetermined

range at first predetermined increments; second local oscillator means for normally producng a second local oscillator signal at a predetermined frequency; frequency varying means coupled with said second local oscillator means and responsive to second predetermined oscillator control signals for varying the frequency of said second local oscillator signal over a second predetermined range of frequencies relative to said predetermined frequency normally produced thereby and at second predetermined increments, said second predetermined increments being smaller than said first predetermined increments; and control circuit means for producing said first and second predetermined oscillator control signals; wherein said frequency varying means comprises counter means coupled to receive said second predetermined oscillator control signals and decoder means coupled to said counter means, for counting and decoding said second predetermined oscillator control signals to form control signals corresponding to frequencies in said second predetermined range and at said second predetermined increments.





4,797,637

PLL FREQUENCY SYNTHESIZER

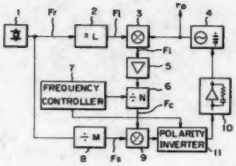
Koyo Kegasa; Takafumi Murai; Osamu Yamanaka, and Takeshi Fujii, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Daisha, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,663

Claims priority, application Japan, Aug. 28, 1986, 61-203410

Int. Cl.[4] H03L *7/00*

U.S. Cl. 331—4 **8 Claims**



1. A PLL frequency synthesizer comprising:

voltage controlled oscillator means which oscillates in response to a frequency signal corresponding to a control signal to be input and which outputs said frequency signal as an output of said PLL frequency synthesizer;

multiplier means for multiplying a reference frequency signal to be input;

mixer means for mixing the frequency signal which is output from said voltage controlled oscillator and the multiplied reference frequency signal which is output from said multiplier, and for outputting a frequency signal representative of a difference therebetween;

variable frequency divider means for dividing said difference frequency signal at a variable dividing ratio;

fixed frequency divider means for dividing said reference frequency signal at a predetermined dividing ratio;

frequency phase comparator means for detecting a phase difference between an output signal from said variable frequency divider and an output signal from said fixed frequency divider and for outputting a phase difference signal therebetween;

filter means for removing high frequency components of said phase difference signal which is supplied as said control signal to said voltage controlled oscillator; and

means for switching the polarity of said phase difference signal;

wherein an output frequency of the voltage controlled oscillator can be switched to either a frequency higher than or a frequency lower than the frequency which is H (H is a positive integer) times as high as the output frequency of said multiplier, or the output frequency of the voltage controlled oscillator can be switched to either a frequency higher than the frequency which is H times as high as the output frequency of the multiplier or a frequency lower than the frequency which is (H+1) times as high as the output frequency of the multiplier.

4,797,638

OSCILLATOR INCLUDING A TRANSISTOR USED BOTH AS CONSTANT CURRENT SOURCE AND AMPLIFIER

Akira Usui, Takatsuki; Kazuhiko Kubo, Osaka, and Hiroyuki Nagai, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

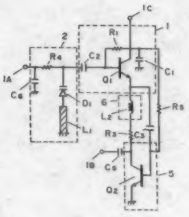
PCT No. PCT/JP86/00359, § 371 Date Apr. 10, 1987, § 102(e) Date Apr. 10, 1987, PCT Pub. No. WO87/00993, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 14, 1986, Ser. No. 30,852

Claims priority, application Japan, Jul. 30, 1985, 60-167924; Jul. 30, 1985, 60-167925; Sep. 26, 1985, 60-213105

Int. Cl.[4] H03B *5/18, 5/12*

U.S. Cl. 331—117 D 4 Claims



1. A local oscillator circuit comprising:

an oscillation transistor having a base, an emitter, and a collector, said oscillation transistor producing an oscillation output signal at said emitter of said oscillation transistor;

a power input connected to said collector of said oscjllation transistor;

means for grounding an alternating current connected to said collector of said oscillation transistor;

resonance circuit means for producing a resonant signal of at least one predetermined frequency connected to said base of said oscillation transistor, said resonance circuit means including a series combination of a variable capacitance diode and a resonator;

an amplifier transistor having a base, an emitter, and a collector, said amplifier transistor producing an amplified oscillation output signal at said collector of said amplifier transistor;

means for reducing an alternating current component of said oscillation signal so that a direct current signal can pass, said alternating current reducing means connected between said emitter of said oscillation transistor and said collector of said amplifier transistor;

means for suppling said oscillation output signal to said base of said amplifier transistor;

means for biasing said amplifier transistor to produce a bias potential on said amplifier transistor; and

an output connected to said collector of said amplifier transistor.

4,797,639

LOW NOISE CRYSTAL CONTROLLED OSCILLATOR

Michael M. Driscoll, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 22, 1987, Ser. No. 57,461

Int. Cl.[4] H03B *5/32*

U.S. Cl. 331—158 6 Claims

1. A low noise crystal oscillator circuit comprising:

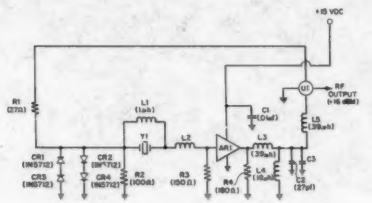
a modular type amplifier having an input, an output, and a ground reference terminal, said amplifier having an input impedance of substantially fifty ohms and an output impedance of substantially fifty ohms;

a tuned circuit having an input, an output, and a ground reference terminal, said tuned circuit having its input coupled to the output of said amplifier, said tuned circuit having an input impedance of substantially fifty ohms and an output impedance of substantially fifty ohms;

an RF signal output terminal;

a power divider having an input, a first output, a second output, and a ground reference terminal, said power divider having its input coupled to the output of said tuned circuit and having its first output coupled to said RF signal output terminal, said power divider having an input impedance of substantially fifty ohms and an output impedance of substantially fifty ohms;

a signal limiter circuit having an input, and output, and a ground reference terminal, said signal limiter circuit having its input coupled to the second output of said power divider, a first resistor coupled between the input and output of said signal limiter circuit, first diode means



having its anode coupled to the output of said signal limiter circuit and its cathode coupled to the ground reference terminal of said signal limiter circuit, and second diode means having its cathode coupled to the output of said signal limiter circuit and its anode coupled to the ground reference terminal of said signal limiter circuit, said signal limiter circuit having an input impedance of substantially fifty ohms; and

a crystal resonator circuit having an input, an output, and a ground reference terminal, said crystal resonator circuit having its input coupled to the output of said signal limiter circuit and its output coupled to the input of said amplifier, a crystal coupled between the input and the output of said crystal resonator circuit, and a second resistor coupled between the input of said crystal resonator circuit and the ground reference terminal of said crystal resonator circuit.

4,797,640

APPARATUS FOR AMPLITUDE MODULATING THE OUTPUT OF A LASER DIODE OR L.E.D.

Maurice C. Heard, Hullbridge, United Kingdom, assignor to The General Electric Company, p.l.c., London, England

Filed Aug. 14, 1986, Ser. No. 896,273

Claims priority, application United Kingdom, Aug. 21, 1985, 8520923

Int. Cl.[4] H04B *9/00*

U.S. Cl. 332—7.51 1 Claim

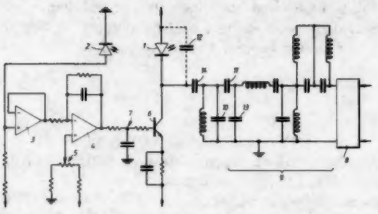
1. Apparatus for generating an amplitude modulated optical signal in response to an input modulating signal comprising

a light emitting diode having a forward conducting direction and an internal capacitance, said light emitting diode emitting light when a current flows therethrough in said forward conducting direction;

a first current source including a photodiode receiving light from said light emitting diode, a comparator coupled to the output of said photodiode and a transistor having its colletor-emitter path connected in series with said light emitting diode and its base connected to the output of said comparator, said comparator comparing the output of said photodiode with a reference signal to generate a substan-

tially constant current component of the forward direction current through said light emitting diode; and

a second current source including a broad band amplifier, a filter network and an impedance transformer coupling said input modulating signal to said light emitting diode to generate a varying current component of said forward



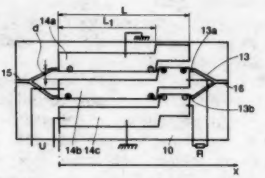
direction current, said impedance matching transformer comprising the internal capacitance of said light emitting diode and capacitive elements only, whereby substantially ideal impedance matching between said filter network and said light emitting diode is obtained for all frequencies of said input modulating signal.

4,797,641

OPTOELECTRONIC MODULATOR

Anders G. Djupsjöbacka, Solna, Sweden, assignor to Telefonaktiebolaget Lm Ericsson, Stockholm, Sweden

Filed Mar. 18, 1986, Ser. No. 840,910
Claims priority, application Sweden, Apr. 30, 1985, 8502113
Int. Cl.[4] G02F *1/03*
U.S. Cl. 332—7.51 **8 Claims**



1. An optoelectric modulator for generating an optical signal comprising a wafer of optoelectronic material, two spaced lightwave conductors having opposite ends at which they are connected to each other to form input and output ends, means for introducing a lightwave of constant amplitude and wave length at said input end, the lightwave undergoing division in the conductors and mutual phase shift, the conductors being uncoupled between the input and output ends so that the divided lightwaves in the conductors do not influence one another, a difference modulation between the conductors being sensed at the output end, and three planar electrodes extending substantially parallel to one another and respectively including transversely offset portions such that two adjacent electrodes define with their longitudinal sides an elongate intermediate space of up to three sections, which are transversely displaced in relation to each other such that one longitudinal side of one of the sections is situated approximately in the line of extension of the other longitudinal side in the adjacent section, the lightwave conductors being disposed along said extension lines so as to be connected with one portion of one electrode and an adjacent portion of the adjacent electrode, means for applying a modulating voltage between the middle electrode and the two outer electrodes, so that the lightwave conductors are modulated in counter-phase in the two adjacent sections by said modulating voltage, the relationship between the lengths of said sections being such that the ratio of the length of the longest section and the length of the electrodes is in the range of 0.70 to 0.94 whereby the modulator has a frequency response between DC and high frequencies.

4,797,642

ZERO-SETBACK SLIDING LOAD FOR NETWORK ANALYZER CALIBRATION

Robert E. Rennard, Evanston, Ill., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 31, 1987, Ser. No. 140,177
Int. Cl.[4] H01P *1/26, 1/00*
U.S. Cl. 333—22 R **11 Claims**

1. An apparatus for connecting to a mating electrical connector, said apparatus comprising:

a housing for mechanically connecting to said mating electrical connector, said housing defining a first connection plane;

a center conductor disposed generally within said housing for mechanically and electrically connecting to said mating electrical connector, said center conductor having a tip portion defining a second connection plane; and

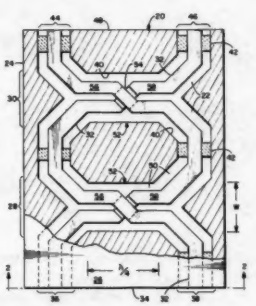
means for extending and retracting said tip portion, said means providing for the extension of said tip portion out of said housing to allow mechanical coupling of said center conductor with said mating electrical connector, said means providing for the retraction of said tip portion into said housing to allow aligning of said second connection plane with said first connection plane while said mating electrical connector is not engaged so that upon connection with said mating electrical connector said second connection plane can be spaced within a predetermined tolerance of said mating electrical connector so as to minimize the separation between said second connection plane and said mating electrical conductor while assuring that minimal axial pressure is applied to said center conductor.

4,797,643

COAXIAL HYBRID COUPLER AND CROSSING ELEMENT

Mon N. Wong, Torrance, and Samuel S. Wong, Lawndale, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 23, 1987, Ser. No. 111,825
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—115 **42 Claims**



1. A coaxial transmission-line crossing-element comprising:

a first hybrid coupler and a second hybrid coupler, each of said couplers having a first input port, a second input port, a first output port, and a second output port; and wherein

said first output port of said first coupler is connected to said first input port of said second coupler, said second output port of said first coupler is connected to said second input port of said second coupler, said first and said second input ports of said first coupler serving as input ports of said crossing element, and said first and said second output ports of said second coupler serving as output ports of said crossing element; and wherein

each of said couplers comprises:

a housing of electrically conductive material having a top wall and a bottom wall, there being a front wall, a back wall, a first sidewall and a second sidewall joining said top wall to said bottom wall, said housing having four openings oriented normally to a common plane, said top wall and said bottom wall being parallel to said common plane, said openings being positioned serially around a center of said housing and pointing outward in different directions;

center conductors disposed in each of said openings to form therewith said input ports and said output ports, said first input port and said first output port being located at opposite ends of said first sidewall, said second input port and said second output port being located at opposite ends of said second sidewall, said first input port and said second input port being located at opposite ends of said front wall, and said first output port and said second output port being located on opposite ends of said back wall;

a pair of bars electrically connecting ports of said first sidewall with ports of said second sidewall, said bars being uniformly positioned apart from each other and from an inner surface of said housing, a first bar of said pair of bars being twisted about a second bar of said pair of bars with a half twist to enable said first bar to interconnect said first input port with said second output port, and to enable said second bar to interconnect said second input port with said first output port; and wherein

in each of said couplers, said half twist comprises a central portion of said first and of said second bars, in each of said bars said central portion having a notch, the notch of said first bar facing and interleaving the notch of said second bar.

4,797,644

PROCESSING HEAD FOR ELECTROPHOTOGRAPHIC APPARATUS

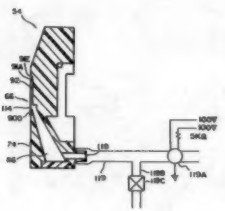
Kazuo Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 8, 1987, Ser. No. 105,785

Claims priority, application Japan, Oct. 8, 1986, 61-239801

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—10 **13 Claims**



1. A process head for use in an electrophotographic apparatus and adapted to supply a developer to an electrophotographic film in a developing section of said electrophotographic apparatus thereby developing a latent image on said electrophotographic film, said process head comprising:

a seal section provided adjacent to said developing section and separated from said developing section by a frame portion which defines said developing section; and

seal pressure supply means capable of supplying to said seal section a seal gas selectively at a first pressure which is higher than the pressure in said developing section and, hence, effective to prevent said developer from leaking out said developing section and at a second pressure which is higher than said first pressure and, hence, effective to drive said gas into said developing section from said seal section beyond said frame portion.

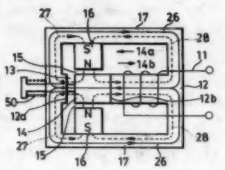
4,797,645

ELECTROMAGNETIC ACTUATOR

Tokio Uetsuhara, Urawa, Japan, assignor to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 774,610, filed as PCT JP84/00084 on Mar. 5, 1984, published as WO85/04044 on Sep. 12, 1985, abandoned. This application Oct. 18, 1985, Ser. No. 794,231

U.S. Cl. 335—230 **2 Claims**



1. An electromagnetic actuator comprising a magnetic circuit consisting of a stationary element and a movable element, and electromagnetic means with a permanent magnet inserted in the magnetic circuit, the permanent magnet being mounted so that the magnetomotive force of the permanent magnet is parallel to that of said electromagnetic means; and the movable element is held within a space in the stationary element so that it can be actuated under monostable condition, characterized in that said electromagnetic means comprises a single electromagnetic coil (**11**) defining two pole faces (**12*a*, 12*b***) so that the movable element contacts one or the other pole face, said permanent magnet (**16**) is fixed to the stationary element in series and contact elements (**37**) are mounted in contact with both pole faces of the permanent magnet (**16**) so as to force the side surfaces of the movable element (**14**) at right angles through the second gap (**15**).

4,797,646

SUPERCONDUCTOR FOR MAGNETIC FIELD SHIELDING

Yoshiro Saji, Osaka, and Eiichi Tada, Kobe, both of Japan, assignors to Yoshiro Saji and Koatsu Gas Kogyo Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 826,291, Feb. 5, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 142,282

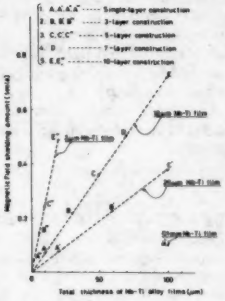
Claims priority, application Japan, Feb. 8, 1985, 60-24254

Int. Cl.[4] H01F *7/00*

U.S. Cl. 335—301 **12 Claims**

1. A magnetic field shield including a superconductor film having a magnetic field shielding effect which abruptly increases from the vicinity of the origin to a turning point of a graph illustrating the relationship between the thickness of a single layer of said superconductor film and the magnetic field shielding effect of said superconductor film, and after said turning point gradually increases as the thickness of said superconductor film increases, said magnetic field shield being char-

acterized in that it comprises at least one composite lamination comprising a thin continuous film of said supeconductor, said



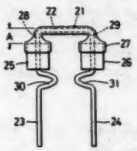
thin continuous film having a thickness not more than that obtained at said turning point and not less than 2 μm.

4,797,647

INDUCTOR AND A MANUFACTURING METHOD THEREFOR

Akira Okubo, Takefu, and Kenichi Sasaki, Imadate, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagokakyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,797
Claims priority, application Japan, Feb. 6, 1987, 62-16714
Int. Cl.[4] H01F *17/06, 15/10, 41/02*
U.S. Cl. 336—175 **3 Claims**



1. An inductor comprising a U-like-shaped lead wire provided at both lengthwise ends of a head with a pair of legs opposite to each and a magnetic material core insertably mounted on at least one of said legs, said inductor characterized in that an exposed portion is formed at said leg of said wire for part of said leg to be exposed between one end of said magnetic material core and said head of said lead wire and an arcuate portion is formed at said leg at the other end side of said magnetic material core.

4,797,648

CHIP INDUCTOR

Toshimi Kaneko; Ryuichi Fujinaga; Tetsuya Morinaga; Atsuo Senda; Toshi Numata, and Hideyuki Kashio, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

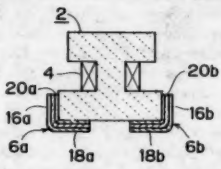
Filed Mar. 9, 1988, Ser. No. 165,763
Claims priority, application Japan, Mar. 9, 1987, 62-53657
Int. Cl.[4] H01F *15/10*
U.S. Cl. 336—192 **7 Claims**

1. A chip inductor comprising:

a magnetic core having a surface;

winding means disposed in relation to said magnetic core;

terminal electrode means electrically connected to said winding means and formed on said surface of said magnetic core; and



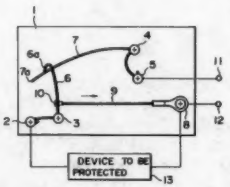
said terminal electrode means including a film made from a nickel alloy.

4,797,649

CIRCUIT BREAKER ACTUATED BY SHAPE MEMORY ALLOY

Dai Homma, Yokohama, Japan, assignor to Naomitsu Tokieda, Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 121,802
Claims priority, application Japan, Nov. 17, 1986, 61-271729
Int. Cl.[4] H01H *61/06, 71/18*
U.S. Cl. 337—140 **7 Claims**



1. A circuit breaker for protecting an electrical device comprising:

a first and a second contactor having respective connecting-/disconnecting means for normally keeping said first and second contactors in contact with each other, and for continuously separating said first and second contactors from each other when a mechanical force of a predetermined value is applied to said means in a predetermined direction; and

a shape memory alloy electrically connected in parallel with said device being protected, said alloy further being mechanically coupled to said means for applying said force in said predetermined direction when the shape memory effect is generated therein.

4,797,650

CMOS BINARY EQUALS COMPARATOR WITH CARRY IN AND OUT

James K. Pickett, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Jun. 25, 1987, Ser. No. 66,654
Int. Cl.[4] G05B *1/00*; G06F *7/02*
U.S. Cl. 340—146.2 **1 Claim**

1. A CMOS binary equals comparator circuit comprising, in combination:

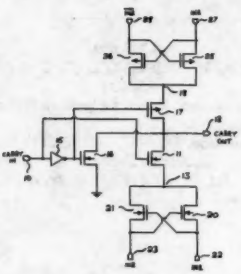
a carry in terminal;

a carry out terminal;

N and P nodes;

a first N channel MOSFET having a drain connected to the carry out terminal, a source connected to the N node, and a gate connected to the carry in terminal;

a first P channel MOSFET having a source connected to the carry out terminal and a drain connected to the P node;
a second N channel MOSFET having a drain connected to the carry out terminal and a source adapted for connection to an electric power supply at a low voltage;
an inverter connecting the carry in terminal to the gates of the first P channel MOSFET and the second N channel MOSFET, whereby the low voltage input to the carry in terminal produces the low voltage output on the carry out terminal;
third and fourth N channel MOSFETs having drains connected to the N node and each having a gate connected to the source of the other, the third and fourth N channel MOSFETs having sources connected to a first bit voltage



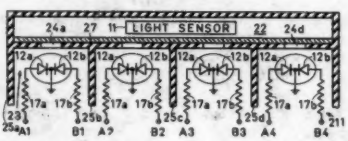
and a second bit voltage, respectively, the first and second bit voltages being one of the low voltage or a higher voltage from the electric power supply; and
second and third P channel MOSFETs having sources connected to the P node and each having a gate connected to the drain of the other, the second and third P channel MOSFETs having drains connected to the first bit voltage and the complement of the second bit voltage, respectively, wherein the complement of the second bit voltage is the other of the low or higher voltages from the power supply from the second bit voltage and whereby, when the higher voltage from the power supply is provided to the carry in terminal, the carry out terminal is at the higher voltage when the first and second bits are equal and the low voltage when they are not.

4,797,651

MULTICOLOR COMPARATOR OF DIGITAL SIGNALS

Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada (M6S 4T2)

Continuation-in-part of Ser. No. 856,196, Apr. 28, 1986, abandoned. This application May 27, 1986, Ser. No. 866,929
Int. Cl.[4] G06F *7/04*
U.S. Cl. 340—146.2 **19 Claims**



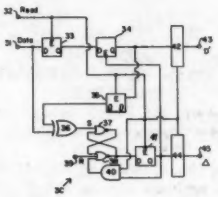
1. A method of comparing a first signal and a second signal, each said signal having either a first level or a second level, comprising the steps of:
developing light of a first color when only said first signal has a first level;
developing light of a second color when only said second signal has a first level;
developing light of a third color when both said first signal and said second signal have a first level;
developing no light when both said first signal and said second signal have a second level;
filtering light to obtain filtered light by removing light of said third color and by transmitting light of said first color or of said second color; and
interrogating said filtered light to determined whether said first signal and said second signal have the same level or different levels.

4,797,652

STATUS REGISTER BIT AND DELTA

Christopher M. Hall, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 607,545, May 7, 1984, abandoned. This application Mar. 17, 1987, Ser. No. 26,715
Int. Cl.[4] G05B *1/00*; G06F *7/02, 7/38*
U.S. Cl. 340—146.2 **2 Claims**



1. A structure for receiving a series of input data signals and providing an output status signal identical to the input data signal and providing an output delta signal indicating if the present input data signal is the same as the previous input data signal, said structure comprising:
an input terminal for receiving said input data signal;
a read enable input terminal for receiving a read enable signal;
a status signal output terminal for providing said output status signal;
a delta signal output terminal for providing said output delta signal;
first means for storing said input data signal, having an input terminal, an enable terminal, and having an output terminal coupled by buffer means to said status signal output terminal;
second means for storing said previous input data signal, having an input terminal connected to said output terminal of said first means for storing, having an output terminal, and having an enable terminal connected to said read enable terminal;
exclusive or means for comparing said input data signal with said previous input data signal stored within said second means for storing, and providing a comparison signal on its output lead indicating if said input data signal is identical to said previous input data signal;
third means for storing said comparison signal, comprising a flip flop and latch combination, said flip flop having a set lead connected to said output lead of said exclusive or means and an output lead connected to the input lead of said latch, said latch further having an enable terminal connected to said read enable terminal, and having an output lead connected to said enable terminal of said first means for storing said output lead further being coupled by buffer means to said delta signal output terminal;
fourth means for storing having an input terminal connected to said input terminal of said structure, an output terminal connected to said input terminal of said first means for

storing and an enable terminal connected to said read enable terminal; and

and gate means having a first input lead connected to said output lead of said latch of said third means for storing, a second input lead connected to said read enable terminal, and an output lead coupled to said reset terminal of said latch of said third means for storing for enabling said first means for storing in response to said comparison signal, thereby storing said input data signal in said first means for storing only when said input data signal and said previous input data signal are different.

4,797,653

DPCM ENCODER

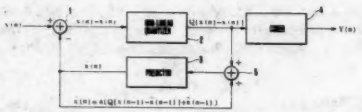
Makoto Takayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1986, Ser. No. 938,268

Claims priority, application Japan, Dec. 26, 1985, 60-292159

Int. Cl.[4] H03M *3/04*

U.S. Cl. 341—51 **5 Claims**



1. A predictive encoder for converting data to variable-length codes and outputting them, comprising:

(A) differential data calculating means for calculating a differential data from an input information data and a predictive data;

(B) quantizing means for quantizing said differential data calculated by said differential data calculating means and outputting a quantized differential data;

(C) predictive data generating means for calculating said predictive data using said quantized differential data output from said quantizing means, and supplying it to said differential data calculating means; and

(D) encoding means for outputting coded data having code lengths corresponding to values of the quantized differential data output of said quantizing means, said encoding means assigning code lengths to the coded data in which assigned code lengths at the +side of values of the quantized differential data and assigned code lengths at the −side thereof are symmetric relative to a center of the quantized differential data which is other than "0".

4,797,654

DATA FORMAT CONVERSION CIRCUIT

John S. Young, Scottsdale; Peter Kruis, Glendale, and William D. Blewitt, Phoenix, all of Ariz., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed May 1, 1987, Ser. No. 44,617

Int. Cl.[4] H03M *7/00*

U.S. Cl. 341—50 **15 Claims**

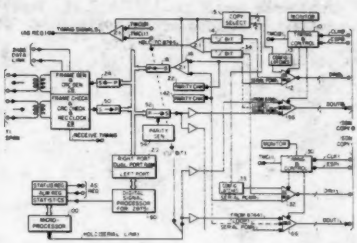
1. A data format conversion circuit for an ISDN system for high-speed conversion between T-carrier format data channels and ISDN format data channels, said data format conversion circuit being operated to store said ISDN data channels in a memory for subsequent transmission, said data format conversion circuit comprising:

timing and control means connected to said ISDN system, said timing and control means being operated to produce a load signal corresponding to each of said ISDN data channels transmitted from said ISDN system and said timing and control means being further operated to produce a once per channel signal corresponding to a number of bits contained with each of said ISDN data channels;

selecting means connected to said timing and control means, said selecting means being operated in response to said load signal and to said once per channel signal to produce an enabling signal for storing each of said ISDN data channels which include valid ISDN format data for conversion to said T-carrier format data channels;

first address generation means connected between said selecting means and said memory, said first address generation means being operated in response to said enabling signal to sequentially produce storage addresses for each of said converted T-carrier data channels, said first address generation means being further operated to produce counts modulo 24 for a predefined number of frames of said T-carrier data channels;

said selecting means being further operated to produce a second load signal;



counting means connected to said selecting means, said counting means being operated in response to said second load signal to produce T-carrier data channel counts in the range of 0 to 191 and said counting means being further operated to produce frame counts in the range of 0 to 23 providing for an extended superframing T-carrier format; and

second address generation means connected between said counting means and said memory, said second address generation means being operated in response to said T-carrier channel counts and to said frame counts (modulo 32) to produce contiguous memory addresses (modulo 24) for storing said data channels corresponding to said channel and frame counts.

4,797,655

DETECTOR SYSTEM FOR MONITORING A FLUID CONTAINING TUBE

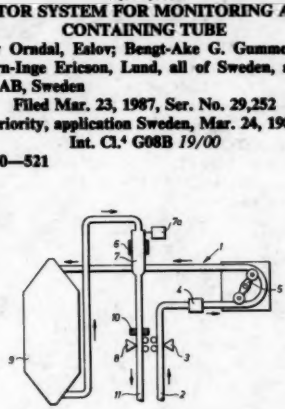
Carl-Henry Orndal, Eslov; Bengt-Ake G. Gummesson, Bara, and Bjorn-Inge Ericson, Lund, all of Sweden, assignors to Gambro AB, Sweden

Filed Mar. 23, 1987, Ser. No. 29,252

Claims priority, application Sweden, Mar. 24, 1986, 8601354

Int. Cl.[4] G08B *19/00*

U.S. Cl. 340—521 **15 Claims**



1. Apparatus for monitoring a fluid flow system including a tube through which fluid is intended to flow comprising mounting means for mounting said tube at a predetermined location, transmitting means for transmitting a signal through

said predetermined location, receiver means for receiving said signal after it has passed through said predetermined location, and sensing means comprising comparator means for comparing said signal received by said receiver means with a first predetermined reference signal for determining whether or not said tube is mounted at said predetermined location and with a second predetermined reference signal for determining whether or not said fluid is contained within said tube, whereby both said determinations can be made on the basis of the same signal received by said receiver means.

4,797,656

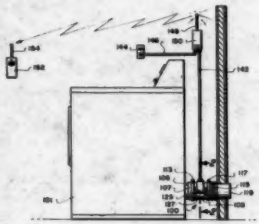
APPLIANCE PAGING SYSTEM

Charles N. Keppler, 498 Huntington Ave., Ventura, Calif. 93004

Continuation-in-part of Ser. No. 7,905, Jan. 28, 1987, abandoned. This application Jan. 21, 1988, Ser. No. 146,714

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—539 **13 Claims**



1. A humidity sensing unit for a clothes dryer comprising in combination:

an adaptor having an inlet end adapted for sealing attachment to an exhaust air fitment of a laundry dryer;

a humidity sensing unit mounted on said adaptor with a sensor element disposed within the adaptor for developing a signal indicative of moisture content of the exhaust air leaving the dryer;

a transmitter for receiving and broadcasting said signal; and

a hand-held receiver for receiving said broadcast signal and for generating an audible or visual signal indicative of an end of a cycle of drying.

4,797,657

PORTABLE SELF-CONTAINED INTRUSION DETECTOR FOR PASSENGER AIRCRAFT

Mark A. Vorzimmer, Houston, and John Beardslee, The Woodlands, both of Tex., assignors to Instant Security Systems, Inc., Houston, Tex.

Filed May 27, 1987, Ser. No. 54,520

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—541 **17 Claims**

1. An intrusion detector for passenger aircraft, comprising:

a portable housing adapted to be hand carried into a detection zone within the aircraft;

a battery disposed in the housing, the battery being connected to power the detector apart from connection to a power source in the aircraft;

at least one detection device including an infrared motion sensor, disposed within the housing and operative to detect activity in the detection zone; and

a control means connected to the at least one detection device, the control means also being connected to activate at least one of an indicator and a signaling means when said activity is detected, the control having a delay feature operable for at least temporarily disabling the intrusion detector such that an authorized individual can temporarily occupy the detection zone without triggering the control means.

4,797,658

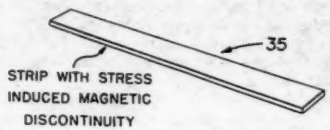
ARTICLE SURVEILLANCE MARKER CAPABLE OF BEING DEACTIVATED BY RELIEVING THE RETAINED STRESS THEREIN AND METHOD AND SYSTEM FOR DEACTIVATING THE MARKER

Floyd B. Humphrey, Meredith, N.H., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Division of Ser. No. 761,611, Aug. 1, 1985, Pat. No. 4,686,516, which is a continuation-in-part of Ser. No. 675,005, Nov. 26, 1984, Pat. No. 4,660,025. This application Jul. 13, 1987, Ser. No. 72,355

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—551 **14 Claims**



1. An electronic surveillance system deactivatable marker comprising a component with retained mechanical stress which is responsive to incident magnetic energy for causing an associated article surveillance system to render an output alarm and is characterized by being deactivatable so as not to render an output alarm upon being relieved of said retained mechanical stress.

4,797,659

METHOD AND A UNIT FOR SYNCHRONIZING BURGLARY DETECTORS

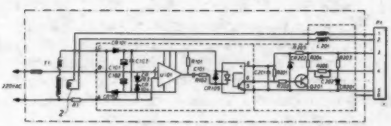
Stig K. Larsen, Roskilde, Denmark, assignor to Anton Security Denmark A/S, Roskilde, Denmark

Filed Jan. 9, 1987, Ser. No. 1,698

Claims priority, application Denmark, Jan. 27, 1986, 395/86

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 **7 Claims**



1. In a system for detecting passage of a marker on an article through an area, the system comprising transmitter and receiver means for alternately transmitting a signal and receiving another, responsive signal from the marker, if in the area during the transmitting, an improved synchronization method, comprising:

providing with a transformer a galvanic separation between

the transmitter and receiver means and power mains therefor, said power mains having a power wave; and

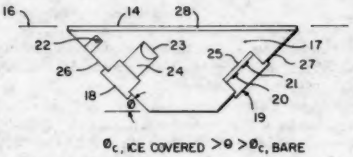
synchronizing the transmitter and receiver means directly to the power wave of the power mains, whereby adjacent systems may be synchronized to each other without other, cable connection therebetween or distortion from the transformer.

4,797,660

PHOTOELECTRIC ICE ACCUMULATION MONITOR USING DUAL DETECTORS

Robert G. Rein, Jr., 3106 128th N.E., Bellevue, Wash. 98005

Filed Mar. 3, 1987, Ser. No. 21,343
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—583 **30 Claims**



1. An ice accumulation monitor for detecting the formation of ice on a surface and measuring the amount of ice accumulated, comprising:

(a) a prism that is transparent to radiation emitted by an emitter and with one surface of the prism exposed to ice accumulation and this surface positioned in the same plane as the surface on which ice accumulation is to be measured;

(b) an emitter of pulsed electromagnetic radiation with means for maintaining the emission intensity independent of temperature, which emitter is oriented so that at the exposed prism surface the emitted radiation is totally reflected within the prism when the exposed prism surface is bare, but at the exposed prism surface the emitted radiation is only partially reflected within the prism when the exposed prism surface is covered with ice and the balance of the emitted radiation is transmitted into the ice layer and reflected at the subsequent ice-air interface;

(c) two radiation detectors located to detect radiation reflected within the prism with one radiation detector located closer to the exposed surface than the other radiation detector; and

(d) a temperature sensor located in the transparent prism near the exposed surface, whereby upper and lower bounds of ice accumulation are measured by comparing outputs from each radiation detector with a calibration curve for that radiation detector.

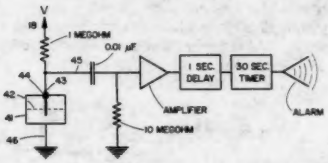
4,797,661

MOTION SENSING DEVICE

Wallace F. Wiley, Prairie Village, Kans., assignor to Robert Hooke Memorial Laboratories, Inc., Prairie Village, Kans.

Filed Aug. 31, 1987, Ser. No. 91,447
Int. Cl.[4] G08B *21/00*; G01C *9/06*; G01P *15/00*
U.S. Cl. 340—664 **33 Claims**

1. A device adapted to sensing motion when activated by passage of an electric current between two electrodes comprised of a container partially filled with a mobile, conductive liquid and first and second electrodes in contact with said conductive liquid with at least said second electrode being partially immersed in said conductive liquid, the immersed



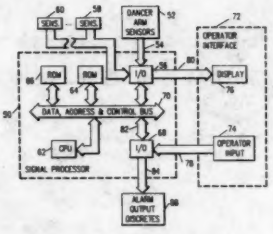
portion of said second electrode receiving the electric current from above the surface of the liquid through a resistor.

4,797,662

WIRE PREBREAK/BREAK DETECTOR

Randall C. Graham, Nashville, and Jeffrey S. Smith, Franklin, both of Tenn., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 25, 1987, Ser. No. 101,231
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—677 **1 Claim**



1. A wire break sensor, comprising:

a plurality of rods having sheaves on an end of each;

a support structure for supporting an other end of each rod and for pivoting each supported end on an axis;

a plurality of sensors, each responsive to the position of a corresponding one of said plurality of rods for providing a position signal having a magnitude indicative thereof;

an operator input device, responsive to operator initiated inputs for providing input signals indicative of wire gauge; and

a signal processor, responsive to said position signals and to said input signal, for retrieving a pair of boundar signals in response to said input signals for comparing the magnitudes of said position signals to said boundary signals and for providing an alarm signal whenever any one of said position signal magnitudes is greater or less than the magnitudes of both of said pair of boundary signals.

4,797,663

PORTABLE SECURITY MONITOR AND TIME RECORDING

Jess Rios, Tucson, Ariz., assignor to Teknate Industries Inc., Tucson, Ariz.

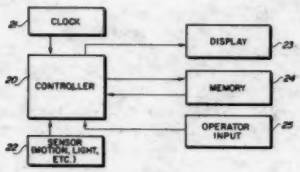
Filed Mar. 12, 1987, Ser. No. 25,174
Int. Cl.[4] G08B *13/08, 13/18, 23/00*
U.S. Cl. 340—691 **22 Claims**

1. An occurrence monitor comprising:

a. a sensor means for generating an electrical signal upon the occurrence of a preselected physical phenomenon within the environment surrounding the occurrence monitor; and,

b. a palm sized monitor having:

1 a clock means,
2. a connector means for connecting/disconnecting said sensor means to said palm sized monitor,
3. an electronic memory means,
4. a controller means in communication with said clock means, said sensor means, and said electronic memory



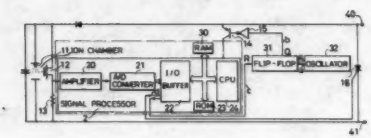
means, said controller means recording in said electronic memory means, the time as defined by said clock means, of any electrical signal received from said sensor means via said connector means, and,
5. fastening means permitting said palm sized monitor to be coupled to and decoupled from a selected object.

4,797,664

ENVIRNMENTAL ABNORMALITY DETECTION APPARATUS

Tatsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,885
Claims priority, application Japan, Sep. 29, 1986, 61-228389
Int. Cl.[4] G08B *23/00*; G05B *9/02*
U.S. Cl. 340—693 **4 Claims**



1. An environmental abnormality detection apparatus comprising:
a detection means for detecting a selected environmental abnormality;
a signal processor means connected to said detection means for processing signals therefrom for determining whether an environmental abnormality has occurred and for generating an alarm signal when the abnormality occurs, said signal processing means also including means for generating an end of processing signal; and
a power source control means for intermittently supplying power to said signal processor and for stopping power supply thereto upon receipt of said end of processing signal from the signal processor.

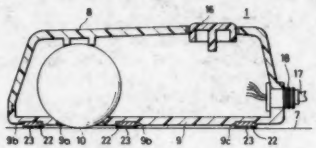
4,797,665

X-Y POSITION INPUT DEVICE

Yuichi Ida, and Junichi Hosogoe, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 6, 1986, Ser. No. 826,860
Claims priority, application Japan, Feb. 6, 1985, 60-14653
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **4 Claims**

1. An input device movable on a base surface comprising a casing with an opening provided in one part of its bottom surface, a globe held rotatably in the casing with a portion thereof projecting through the opening to engage and roll on the base surface when the input device is moved thereon,
the improvement comprising:
said bottom surface of the casing having an annular groove (9*b*) formed therein surrounding the opening in said one part thereof through which the globe portion projects, a cushion member bonded in said annular groove, and a slidable sheet bonded to the cushion member, and
said bottom surface further having a rectangular groove (9c) formed in another part thereof spaced from said opening



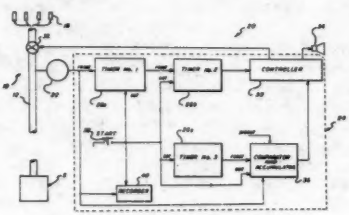
in said one part, a corresponding cushion member bonded in said rectangular groove, and a slidable sheet bonded to said cushion member,
wherein said slidable sheets bonded to said cushion members in said annular groove and said rectangular groove project downward from the bottom surface of the cashing for making resilient, noiseless, low-friction sliding contact when said casing is moved on the base surface, and said slidable sheet bonded to said cushion member in said annular groove prevents foreign material from becoming adhered to said globe projecting through said opening.

4,797,666

METHOD AND APPARATUS FOR MONITORING FLUID FLOW

Carlton J. Baxter, 74 Sawmill Rd., Penfield, N.Y. 14526, and David C. Baxter, 93 Carlisle St., Rochester, N.Y. 14615

Filed Sep. 16, 1986, Ser. No. 908,015
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—606 **12 Claims**



THE FIGURE

8. In a fluid supply system, a method of monitoring fluid flow so as to produce a control signal upon determining that either an abnormal flow condition or a catastrophic flow condition exist in such supply system, said method comprising the steps of:
(1) continuously sampling the flow of fluid in said supply system and measuring the flow volume;
(2) during a preselected time period, determining if the flow is less than a minimum preselected flow during a preselected shorter time period;
(3) producing a control signal indicative of an abnormal flow condition if the flow determined in step (2) is not less than the minimum preselected flow volume during such preselected shorter time period;
(4) comparing an accumulated running total of the flow in a third preselected time period with a predetermined maximum flow for such period; and

(5) producing a control signal indicative of a catastrophic flow condition if such accumulated running total flow exceeds such predetermined maximum flow.

4,797,667

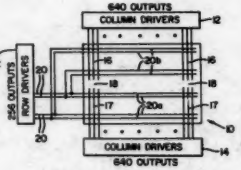
SPLIT SCREEN ELECTRODE STRUCTURE FOR TFEL PANEL

Brian J. Dolinar, Lake Oswego; Robert T. Flegal, Beaverton, and Larry L. Lewis, Portland, all of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Division of Ser. No. 729,974, Apr. 30, 1985, Pat. No. 4,739,320. This application Nov. 2, 1987, Ser. No. 116,630

Int. Cl.[4] G09G *3/30*

U.S. Cl. 340—781 **3 Claims**



1. An electrode structure for an AC matrix-addressed thin film electroluminescent (TFEL) panel comprising:

(a) a top set of scanning electrodes located in an upper half of said panel and extending from a first edge thereof across the panel to anm opposite edge;

(b) a bottom set of scanning electrodes located in a bottom half of the panel and extending from said first edge of the panel across the panel to said opposite edge;

(c) a top set of data electrodes located in said upper half of said panel extending at right angles to said top set of scanning electrodes for a distance slightly less than halfway across said panel;

(d) a bottom set of data electrodes located in a bottom half of said panel extending at right angles to said bottom set of scanning electrodes for a distance of slightly less than halfway across said panel;

(e) scanning electrode driver means for simultaneously energizing scanning electrode pairs, each pair comprising an electrode from said top set and an electrode from said bottom set, in line-by-line fashion; and

(f) data electrode driver means for simultaneously energizing selected ones of said top and bottom data electrode sets as each said scanning electrode pair is energized.

4,797,668

ACOUSTIC WELL LOGGING SYSTEM HAVING MULTIPLEXED FILTER DIGITIZING

Mark D. Zimmer, Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 12, 1986, Ser. No. 941,133

Int. Cl.[4] G01V *1/40*

U.S. Cl. 340—857 **10 Claims**

1. A downhole well logging system including a fluid tight sonde sized and adapted for passage through a well bore for use in acoustic well logging for acoustic travel time measurement and full waveform acoustic signal processing comprising:

means housed in said sonde for generating a high frequency content acoustic signal having a peak energy content in the frequency range from 10 to 15 kilohertz and having several propagation modes in a well borehole;

means housed in said sonde and spaced longitudinally from said signal generating means by at least an 8 to 10 foot spacing distance, for detecting arriving acoustic energy signals propagated through a well borehole and for generating analog electrical signal waveforms representative thereof;

selectable analog high pass filter means housed in said sonde for supplying, in response to a control signal, selectably filtered representations of said representative analog waveform electrical signals as input to an analog to digital converter for conversion to digital form; and

means housed in said sonde and responsive to signals output from said analog to digital converter, for generating said control signal to said selectable filter means, said control signal generating means having digital logic means for detecting the arrival of compressional wave acoustic modes at said detecting means and generating a control signal to change the frequency response of said selectable filter means subsequent thereto from a higher frequency cutoff limit to a lower frequency cutoff limit.

4,797,669

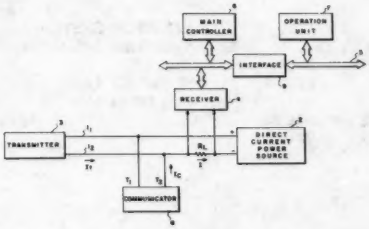
RECEIVER

David L. McGowan, III, Warminster; Arthur M. Olsen, Pennsburg, and Steven M. Oxenberg, Richboro, all of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 1, 1986, Ser. No. 913,925

Int. Cl.[4] G08C *15/00*

U.S. Cl. 340—870.40 **15 Claims**



1. A receiver for receiving a digital reception signal defining a measured value, the receiver being connected to a transmission line used for transmitting a digital command signal from a communicator, the digital reception signal from a transmitter, and a response signal responding to the command signal comprising

time defining means connected to the transmission line and discriminating that a nonsignalling state of said transmission line has continued for a predetermined period by producing an output signal indicative thereof, and

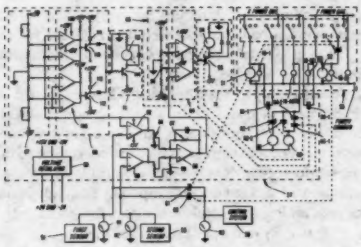
control means connected to receive said output signal and validating a specific period of the reception signal received after the discrimination operation of said time defining means.

4,797,670

REDUNDANT SIGNAL SELECTOR SYSTEM

Luther L. Joyner, Forest, Va., assignor to Joyner Engineers & Trainers, Inc., Forest, Va.

Filed Jan. 30, 1987, Ser. No. 11,764
Int. Cl.[4] G05B 23/02; G08B 23/00
U.S. Cl. 340—825.170 41 Claims



1. A signal selector system which selects a signal for control of various operating parameters in a process facility, comprising:

a display;

first and second sensing means each for providing a signal representative of a single controlled parameter, the first signal being preferred as a control signal for the parameter;

switch means on said display for manually selecting between the first and second signals or for selecting an automatic selection mode;

means for determining if said first signal is unacceptable including means for comparing said first and second signals to one another and to a first pre-selected threshold value and for comparing said first signal to a second threshold value;

means for automatically switching to said second signal when said first signal is unacceptable when the switch means is in the automatic selection mode; and

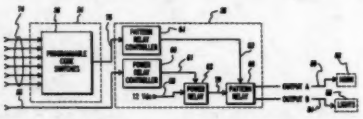
means on said display for indicating when said determining means indicates that at least the first pre-selected threshold value has been exceeded.

4,797,671

MOTOR VEHICLE LOCATOR SYSTEM

Robert P. Toal, Jr., 3545 Carman Road, Schenectady, N.Y. 12303

Filed Jan. 15, 1987, Ser. No. 3,644
Int. Cl.[4] H04Q 7/00; H04B 7/00
U.S. Cl. 340—825.490 18 Claims



1. A programmable operator actuated motor vehicle locator system, said system comprising:

transmitter means for generating a transmission signal;

receiver means associated with a motor vehicle for outputting a trigger signal in response to said transmission signal;

a pattern generator connected to the output of said receiver means;

adjustable programming means associated with said generator for operator preselection of a pattern signal comprising a predefined number of signal units, each of said signal units having one of two different values, said programming means being readily adjustable to allow for operator definition of each signal unit's value, said preselected pattern signal being outputted by said associated pattern generator and programming means in response to said trigger signal; and

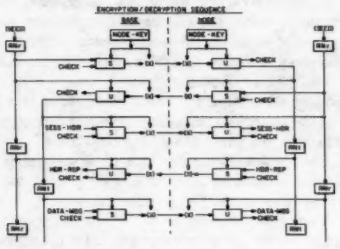
translation means responsive to the output of said associated pattern generator and programming means for converting said operator selected pattern signal into a unique, motor vehicle emitted audible/visual location signal comprising a train of discrete pulses, each pulse of said train comprising an audible or visual signal, each of said signal units being sequentially converted to either an audible or visual signal pulse by said translation means in predefined relation to the operator assigned value thereof, whereby the locator system allows an operator to easily select and modify individual signal pulses within the train of discrete audible or visual signals emitted by the system once activated.

4,797,672

VOICE NETWORK SECURITY SYSTEM

Paavo T. Kousa, Campbell, Calif., assignor to Octel Communications Corp., Milpitas, Calif.

Filed Sep. 4, 1986, Ser. No. 904,085
Int. Cl.[4] H04L 9/02
U.S. Cl. 340—825.300 3 Claims



1. A communication security system comprising

a base station,

one or more node stations,

means for transmitting a first signal from said base station to a first one of said node stations,

said first node station responsive to said first signal for transmitting a second response signal to said base station,

said base station responsive to said second response signal for generating a node encryption key which includes a node identification number of said first node station and an arbitrary number,

said base station further including means for generating a first random number, means for encrypting said first random number with said node encryption key, and means for transmitting said first encrypted random number to said first node station,

said first node station including means for decrypting said encrypted random number to recover said first random number to act as a seed for subsequent encrypted transmissions to said base station, means for generating a second random number, means for encrypting said second random number with an encoding key based upon said decoded first random number to form a second encrypted random number, and means for transmitting said second encrypted number to said base station,

said base station including means for decoding said transmitted second encrypted number to recover said second random number to act as a seed for subsequent encrypted transmissions to said first node station.

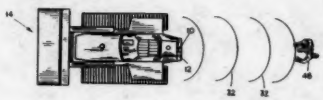
4,797,673
DRIVER ALERTING DEVICE

Anthony E. Dombrowski, Omaha, Nebr., assignor to Steven F. Sommers, Omaha; Bruce E. Schreiner, Grand Island; Land Paving Company, Omaha; Omni Holding Company, Omaha; Jerry Rouk, Omaha and Robert Wichser, Omaha, all of, Nebr.

Continuation of Ser. No. 895,535, Aug. 13, 1986, abandoned, which is a continuation of Ser. No. 646,838, Sep. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 579,160, Feb. 10, 1984, abandoned. This application Apr. 1, 1988, Ser. No. 178,778

Int. Cl.[4] G08G *1/00*

U.S. Cl. 340—904 9 Claims



1. An alarm device for construction equipment, comprising, a transceiver comprising a micro-wave radar device using the doppler shift principle to detect the presence of a target within the transceiver range,

means for supporting said transceiver at the rearward end of the equipment for directing the wave output thereof rearwardly of the equipment,

means for supplying to said receiver return wave signals from any target within the transceiver range, an intermediate frequency amplifier operatively connected to said transceiver, said amplifier being operative to amplify and shape said return wave signals, an indicator on the equipment,

means for electrically connecting said indicator to said transceiver for activation of said audible indicator in response to detection by said transceiver of return wave signals from any target within the transceiver range, and

means for operatively electrically connecting said transceiver to means associated with the transmission of the equipment whereby said transceiver will only be activated in response to the transmission of said equipment being placed in reverse gear, said device being substantially unaffected, in operation, by varying weather conditions.

4,797,674
FLIGHT GUIDANCE SYSTEM FOR AIRCRAFT IN WINDSHEAR

Terry L. Zweifel, Phoenix, and David A. Johnson, Chandler, both of Ariz., assignors to Honeywill Inc., Minneapolis, Minn.

Filed Feb. 28, 1986, Ser. No. 834,729

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—968 27 Claims

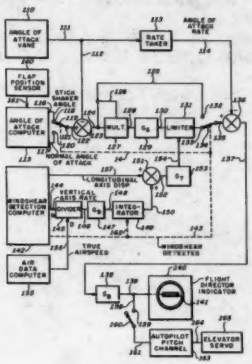
1. A method for providing a flight command signal for optimizing the flight path of an airborne aircraft encountering a windshear condition, comprising the steps of:

(a) providing a signal proportional to true air speed rate,

(b) providing a signal proportional to a vector rate of change of the windshear condition,

(c) providing a signal proportional to an angle of attack,

(d) deriving an error signal representative of a desired change in air speed rate by applying said angle of attack signal to limit said vector rate signal whereby as the difference between actual angle of attack and stick shaker angle of attack decreases, the vector rate signal decreases,



(e) algebraically subtracting said true air speed rate signal from said error signal to derive said command signal.

4,797,675
PROCEDURE FOR COUNTING MOVING OBJECTS AS THEY STOP

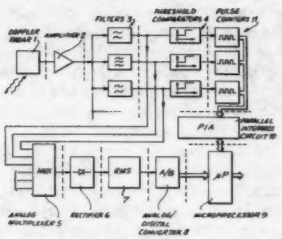
Seppo Ovaska, Hyvinkää , Finland, assignor to Elevator GmbH, Baar, Switzerland

Continuation of Ser. No. 740,302, Jun. 5, 1985, abandoned, which is a continuation of Ser. No. 555,479, Nov. 28, 1983, abandoned, which is a continuation of Ser. No. 246,624, Mar. 23, 1981, abandoned. This application Apr. 23, 1987, Ser. No. 41,633

Claims priority, application Finland, Mar. 27, 1980, 800954

Int. Cl.[4] G01S *13/56*

U.S. Cl. 342—28 13 Claims



1. A procedure for counting moving objects as they slow and stop, comprising the steps of:

monitoring the movements and stopping of the objects, by use of at least one Doppler radar module directed at the objects and which provides an output signal;

identifying changes of velocity of the objects by said radar output signal R.M.S. amplitude changes and Doppler radar signal pulses derived from said radar output signal; and

calculating the number of objects slowing and stopping after said velocity changes occur from the magnitude of the radar output signal R.M.S. amplitude changes taking place during slow-down of the objects and from the number of Doppler radar pulses recorded.

4,797,676

SURVEILLANCE RADAR SYSTEM

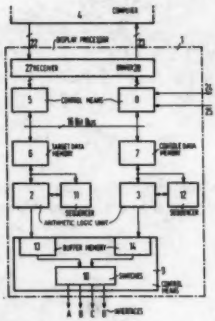
Norbert Koelmans, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,392

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626035

Int. Cl.[4] G01S 7/08, 7/22; G06F 15/626; G09G 1/14

U.S. Cl. 342—176 7 Claims



1. A surveillance radar system comprising, a plurality of picture screens mounted in consoles and selectable to display different graphics data from a display processor which receives graphics data, such as target data, console-associated data, background information data in the form of lines, ciroles, texts, traces or the like, alarm reports and interface test data from a computer and edits these data upon receipt of individual console requests, and, after editing, forwards them by way of a plurality of output interfaces which are referred to as refresh channels to the console picture screens for display, characterized in that first and second arithmetic logic units (2, 3) operated in parallel are provided in the display processor (1), said first logic unit (2) editing the target data and said second logic unit (3) editing the console-associated data and background information data; the data transfer from the computer (4) to the arithmetic logic units (2, 3) is executed by a separate control means (5) which stores the target data in a target data memory (6) connected to input of said first logic unit (2) for processing the target data and storing the console-associated data and background information data in a console data memory (7) connected to input of said second the logic unit (3) for processing these data; a separate control means (8) is provided for processing information between aid first and second arithmetic logic units (2, 3) and said individual consoles, said separate control means (8) assuring that console status words, for example, current settings of scale and decentering of all consoles are available in said target and said console data memories (6, 7) for coordinate transformation; and a third control means (9) provided at the output side in said display processor (1), said third control means (9) comprising an electronic switch (10) for driving the output interfaces (A, B, C, D) allocated to the refresh channels, output interfaces being supplied with the data edited in said target data first logic unit (2) and in said console data second logic unit (3) and said output interfaces providing these data in coordinated form for forwarding to the respective refresh channels.

4,797,677

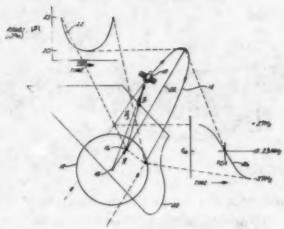
METHOD AND APPARATUS FOR DERIVING PSEUDO RANGE FROM EARTH-ORBITING SATELLITES

Peter F. MacDoran, Pasadena, and Donovan J. Spitzmesser, La Crescenta, both of Calif., assignors to Istac, Incorporated, Pasadena, Calif.

Continuation-in-part of Ser. No. 437,819, Oct. 29, 1982, abandoned. This application May 19, 1986, Ser. No. 865,958

Int. Cl.[4] H04B 7/185

U.S. Cl. 342—352 5 Claims



1. A method for deriving pseudo range from a user to earth-orbiting, signal-transmitting satellites that transmit a radio frequency signal having a component at a given frequency, the method comprising the steps of:

intercepting the signal from each satellite at the position of the user;

recovering the component from the intercepted signal from each satellite;

measuring the phase of the component;

measuring the frequency of the component;

deriving from the measured phase and frequency of the intercepted signal component from each satellite a fractional phase;

deriving from the measured frequencies from at least two satellites a Doppler range value;

dividing the Doppler range value by the wavelength of the given frequency to produce an integer and a remainder; and

adding the integer to the fractional phase.

4,797,678

DEVICE FOR PREDICTING UNIQUE WORD DETECTION POSITIONS IN A TDMA STATION BY USING LATEST VALID DETECTION POSITIONS

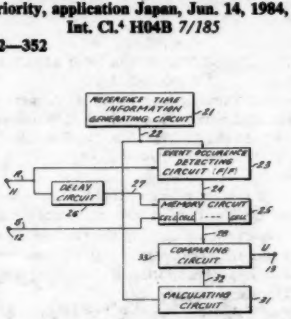
Akira Tsuji, and Haruki Takai, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 13, 1985, Ser. No. 744,377

Claims priority, application Japan, Jun. 14, 1984, 59-123199

Int. Cl.[4] H04B 7/185

U.S. Cl. 342—352 4 Claims



1. A receive position predicting device for use in a receiving arrangement of an earth station of a time division multiple

access satellite communication network in predicting, in response to a sequence of burst identifying flags identifying those time slots repeatedly in time division multiple access frames at which bursts are received and in response to a unique word detection pulse indicative of detection of a unique word in a burst received as a reception burst in a current frame of said time division multiple access frames, a position of detection of the unique word in another burst which corresponds to said reception burst in a next succeeding frame of said time division multiple access frames, said device comprising:

reference time information generating means for generating a sequence of reference patterns representative of reference time information along each time division multiple access frame;

event occurrence detecting means coupled to said reference time information generating means and responsive to said unique word detection pulse for detecting an instant of occurrence of said unique word detection pulse to produce one of said reference patterns as a selected pattern that represents said instant;

memory means coupled to said event occurrence detecting means and responsive to said sequence of burst identifying flags used as an address signal and to said unique word detection pulse used as a write pulse for memorizing said selected pattern as a memorized pattern and responsive to the sequence of burst identifying flags of said next succeeding frame for producing said memorized pattern as a read-out pattern;

calculating means coupled to said reference time information generating means for adding an offset amount to the reference time information represented by the respective reference patterns to produce a sequence of offset representing patterns representative of offset time information; and

comparing means for comparing said read-out pattern with said offset representing patterns to produce a receive position predicting pulse predictive of said position of detection when said read-out pattern is coincident with one of said offset representing patterns.

4,797,679

RADIO DIRECTION-FINDING USING TIME OF ARRIVAL MEASUREMENTS

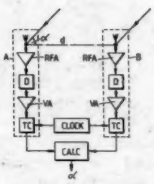
Anthony R. Casdin, Horley; Alan F. Dadds, Hartfield, and Peter Mallinson, Redhill, all of England, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1987, Ser. No. 59,730

Claims priority, application United Kingdom, Jun. 10, 1986, 8614107; Jun. 10, 1986, 8614108

Int. Cl.[4] G01S *1/24*

U.S. Cl. 342—387 **29 Claims**



1. A method of determining the direction of incidence of electromagnetic wave signals from a distant source from the time of arrival of the leading edge of the wave signals, wherein the method comprises:

receiving said signals at a plurality of mutually spaced wave-receiving elements,

detecting the respective instantaneous amplitude of the signal received at each element,

measuring the times at which the detected amplitudes of wave signals received respectively at at least two of said elements first exceed a minimal threshold value such that signals can be satisfactorily distinguished from noise and which is substantially less than the minimum peak value of signals whose direction of incidence is to be determined by said method, the time being measured in such a manner that the measured time is generally unaffected by multi-path propagation,

determining the difference between the measured times in respect of one pair or of a plurality of pairs of said elements, wherein the two elements of said one pair or of each of at least two of said plurality of pairs are sufficiently close together that the length of the interval of time within which signals from the same source must arrive at the two elements is so short that there is a high probability in operation that no signals from another source will arrive in that interval, and

deriving a representation of the direction of incidence from the time difference(s) utilising the relationship

$$\cos \alpha = c\delta t/d$$

where α is the angle between the direction of incidence of the signals and the line joining the two elements of a said pair, d is the distance between those two elements, δt is the time difference in respect of that pair of elements, and c is the free-space velocity of electromagnetic waves.

4,797,680

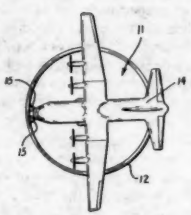
AIRBORNE ANTENNA PLATFORM

Rollo G. Smethers, Jr., Atlanta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Sep. 16, 1985, Ser. No. 776,264

Int. Cl.[4] H01Q *1/28*

U.S. Cl. 343—705 **8 Claims**



1. An airborne antenna platform comprising:

(a) an aircraft having wing structural elements for the attachment of external equipment;

(b) an antenna housing having a substantially circular configuration and a substantially elliptical cross-section, said antenna housing cross-section having a major axis L and a minor axis D, the ratio of L to D being on the order of about 2.6 to 1;

(c) a plurality of attachment members for flexibly affixing said antenna housing to said aircraft, said attachment members comprising:

(1) a pair of fasteners having a predetermined length such that the distance of the antenna housing beneath the wing of said aircraft minimizes the possibility that said housing will contact the ground during takeoff or landing, each of said fasteners being adapted for pivotal attachment to said wing structural elements and to said housing, said fasteners having at least a load bearing support;

(2) strut extensions for attaching said antenna housing to the nose of said aircraft; and

(3) fastener means for fastening said antenna housing to the afterbody of the fuselage of said aircraft; and

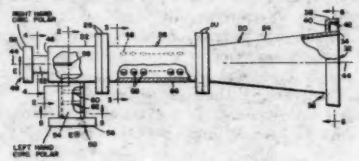
(d) an antenna, housed within said antenna housing, for transmitting and receiving electromagnetic energy.

4,797,681

DUAL-MODE CIRCULAR-POLARIZATION HORN

Sidney Kaplan, Los Angeles, and Mon N. Wong, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 5, 1986, Ser. No. 871,194
Int. Cl.[4] H01Q 13/02; H01P 1/161
U.S. Cl. 343—786 13 Claims



11. A dual mode circularly polarized horn radiator comprising:

means, including a radiating aperture, for radiating circularly polarized electromagnetic radiation, said aperture having a diameter of approximately one free-space wavelength of the radiation. said means for radiating including means for buffering said radiating aperture to improve uniformity in a pattern of the radiation;

conversion means for providing a conversion between circularly polarized and linearly polarized radiation, said conversion means including a set of phase shift elements spaced apart by one-eighth the guide wavelength of the radiation for conversion between both clockwise and counterclockwise circularly polarized radiation and two orthogonal linearly polarized waves;

coupling means including a first port and a second port for propagation of respective ones of said linearly polarized waves, said coupling means coupling said linearly polarized waves individually between said conversion means and respective ones of said ports; and

means within said coupling means for isolating said linearly polarized waves from each other, said isolating means including first and second planar blade structures oriented along axes of respective ones of said ports, said first blade structure comprising a single blade extending along a direction of radiation propagation in said coupling means a distance of one-half of the guide wavelength of the radiation and said second blade structure comprising a pair of coplanar blades positioned along a plane perpendicular to a plane of said blade in said first blade structure, the blades of said second blade structure being of shorter dimension than the blade of said first blade structure, as measured along a direction of wave propagation.

4,797,682

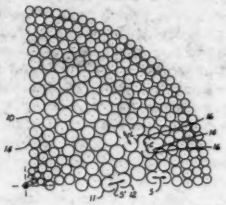
DETERMINISTIC THINNED APERTURE PHASED ANTENNA ARRAY

William N. Klimczak, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 8, 1987, Ser. No. 59,353
Int. Cl.[4] H01Q 21/00
U.S. Cl. 343—844 10 Claims

1. An improved antenna array of the type having a thinned aperture defined by a plurality of radio frequency radiating elements operable over a preselected bandwidth and having a desired gain, said antenna array producing a main lobe signal and side lobe signals within said bandwidth, wherein the improvement comprises:

the radiating elements being arranged in at least first, second and third groups thereof concentrically disposed about a reference point, said first, second and third groups being respectively spaced at successively greater distances from said reference point with said second group positioned between said first and third groups, the radiating sizes of the elements in said first and third groups being smaller than those of the elements in said second group, whereby to increase the amplitude and directivity of said main lobe



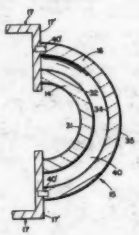
signal and minimize the amplitude of said side lobe signals relative to said main lobe signal.

4,797,683

MULTI-SPECTRAL RADOME

Lester H. Kosowsky, Stamford; Peter E. Raber, Milford, both of Conn., and Brian J. Horais, Oakton, Va., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 1, 1986, Ser. No. 913,898
Int. Cl.[4] H01Q 1/42, 1/28
U.S. Cl. 343—872 6 Claims



1. A dual radome for permitting the ingress and egree of selected first and second frequency bands of radiation comprising inner and outer layers disposed about means for transmitting and/or receiving electromagnetic radiation in both said first and second frequency bands, in which said inner layer is transmissive to both said first and second frequency bands of radiation, and characterized in that:

said outer layer is transmissive to at least one of said bands of radiation;

said outer layer is formed from an abrasion and weather resistant material; and

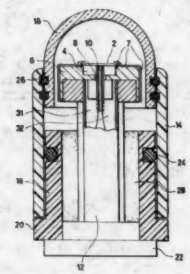
said arrangement includes removing means for removing said outer layer, whereby said radome arrangement is operable in a multimode detection system having a first mode in which said radome passes only radiation in said first frequency band through both said inner and outer layers and a second mode in which said outer layer is removed and said radome passes radiation in both said first and said second frequency bands through said inner layer.

4,797,684

WAVEGUIDE-FED MICROWAVE SYSTEM PARTICULARLY FOR CAVITY-BACKED SPIRAL ANTENNAS FOR THE KA BAND

Joel Bernstein, Petach Tikva, and Samuel Spinner, Rishon Lezion, both of Israel, assignors to Elisra Electronic Systems Ltd., Benei Brak, Israel

Filed Jan. 13, 1987, Ser. No. 3,039
Claims priority, application Israel, Jan. 17, 1986, 77635
Int. Cl.[4] H01Q *1/36*
U.S. Cl. 343—895 18 Claims



1. A waveguide-fed microwave system designed particularly for the Ka band, comprising:

a waveguide transmission line;

a microwave device having a pair of balanced, parallel feed wires separated by a dielectric;

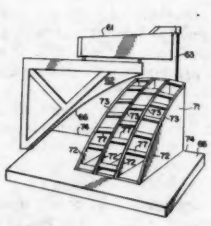
and a doubled-tapered ridge transformer directly connecting the waveguide transmission line to the balanced, parallel feed wires of the microwave device, said double tapered-ridge transformer comprising a pair of ridges fixed at their outer edges to, and in electrical contact with, the inner face of the waveguide transmission line at opposite sides thereof in alignment with each other and forming a gap between the inner edges of said ridges, said gap being formed with a taper which decreases in width from the waveguide transmission line to the pair of balanced, parallel feed wires, thereby providing a smooth, direct symmetrical transition between said waveguide transmission line and said microwave device.

4,797,685

OFFSET SHAPED ANTENNA REFLECTOR

Michael G. Guler; Sharadchandra D. Patel, both of Melbourne; James K. Conn, Indialantic, and Marcus L. Foster, Palm Bay, all of Fla., assignors to Harris Corp., Melbourne, Fla.

Division of Ser. No. 676,924, Nov. 30, 1984, Pat. No. 4,688,325.
This application Oct. 27, 1986, Ser. No. 923,419
Int. Cl.[4] H01Q *15/16*
U.S. Cl. 343—912 11 Claims



1. An antenna reflector, the surface configuration of which is unsymmetric with respect to any axis, made by the method comprising the steps of:

(a) analyzing the surface configuration of a reflector to be fabricated and, on the basis of the analysis, establishing a geometrical surface of revolution describable about a prescribed axis, at least a portion of said geometrical surface of revolution containing a shape approximating that of the surface configuration of said reflector to be fabricated; and

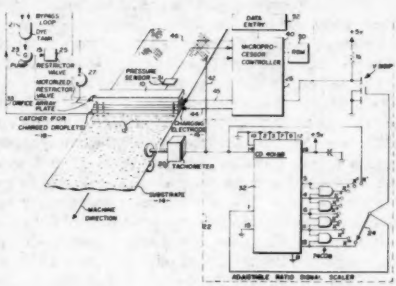
(b) engaging a reflector tooling device with material of which the antenna reflector is to be fabricated, and sweeping said reflector tooling device about said prescribed axis about which said geometrical surface of revolution is describable while maintaining engagement of the tooling device with the material, thereby shaping the material into a reflector that conforms with said geometrical surface of revolution and effectively contains said unsymmetric surface configuration.

4,797,686

FLUID JET APPLICATOR FOR UNIFORM APPLICATIONS BY ELECTROSTATIC DROPLET AND PRESSURE REGULATION CONTROL

Joseph P. Holder, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 908,289, Sep. 17, 1986, which is a division of Ser. No. 729,412, May 1, 1985, Pat. No. 4,650,694.
This application Mar. 3, 1987, Ser. No. 21,358
Int. Cl.[4] G01D *15/18;* B05C *11/00;* B05B *5/00*
U.S. Cl. 346—1.1 23 Claims



1. A hybrid fluid jet applicator having an orifice array, means for supplying pressurized fluid to said orifice array, and means for selectively charging and deflecting fluid droplets to control the quantity of fluid striking a moving substrate, said hybrid fluid jet applicator further comprising:

means for controlling said fluid jet applicator to operate in an electrostatic control mode;

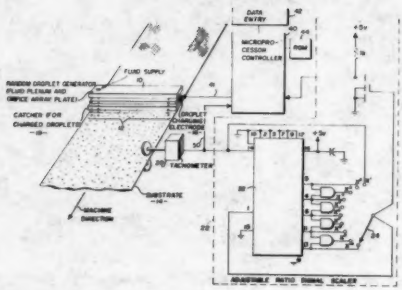
means for sensing when said fluid is being supplied at a predetermined flow rate in said electrostatic control mode and for generating a signal indicative thereof; and

means, responsive to said signal from said means for sensing, for controlling said applicator to operate in a non-electrostatic control mode and for increasing said flow rate to a level beyond said predetermined rate.

4,797,687
PATTERNING EFFECTS WITH FLUID JET APPLICATOR

Joseph P. Holder, Greensboro; Michael I. Glenn, Burlington; Bobby L. McConnell, and Louis A. Graham, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 908,289, Sep. 17, 1986, which is a division of Ser. No. 729,412, May 1, 1985, Pat. No. 4,650,694. This application Mar. 16, 1987, Ser. No. 26,413
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 24 Claims



1. A method of applying patterns to a moving substrate using an electrostatic fluids jet applicaotr which employs random drop formation processes, said applicator having a linear array of orifices extending along a transverse or cross-machine direction with respect to said substrate motion, means for selectively charging fluid droplets emanating from said orfice array including a single ganged electrode extending in said cross-machine direction, said means for charging fluid droplets operating to simultaneously charge or not charge all fluid droplets then being formed in an electrostatic charging zone disposed downstream of the orifices, said applicator including means for passing droplets onto said moving substrate only during controlled successive print times T, and not passing droplets onto said moving substrate during controlled time intervals between such successive print times, said method of applying patterns comprising the step of:

selecting a predetermined desired patterning effect to be generated from a plurality of distinct patterns which may be generated by said applicator;

setting said print time T to a predetermined value to initiate said desired patterning effect,

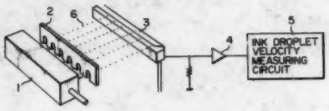
simultaneously charging or not charging all fluid droplets in said electrostatic charging zone using said single ganged electrode, and

controlling said electrostatic fluid jet applicator to apply a pattern to said substrate over a substantial length of substrate which pattern is not merely a solid shade by controllably varying at least one of said print times T and said controlled time intervals between print times to generate said desired patterning effect.

4,797,688
MULTI-NOZZLE INK-JET PRINTER

Tatsuya Furukawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,760
Claims priority, application Japan, Oct. 4, 1985, 60-221413
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 40 Claims



1. A multi-nozzle ink-jet printer comprising:

ejecting means for ejecting a plurality of ink droplets substantially at the same time in parallel in a predetermined direction;

charging means for charging said plurality of ink droplets selectively;

means for producing a deflecting electric field through which said plurality of ink droplets fly through, thereby causing said ink droplets to be deflected depending on an amount of charge carried by each of said ink droplets;

collecting means located at a predetermined distance away from said ejecting means for collecting those of said ink droplets which have not been deflected over a predetermined amount, said collecting means being comprised of an electrically conductive material at least partly for producing a detection signal upon detection of said ink droplets; and

measuring means electrically connected to said collecting means for measuring an average velocity of said plurality of ink droplets based on said detection signal.

4,797,689
ULTRASONIC VIBRATION DRIVING TYPE THERMAL PRINTER

Sadaaki Nanai, Saitama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,626
Claims priority, application Japan, May 25, 1987, 62-127324
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 2 Claims

1. In a thermal printer in which dye is transferred from a film to a receiver in response to heating including:

a. a thermal head having a plurality of heating elements arranged in a predetermined configuration and selectively energized on the basis of print data;

b. said heating elements being brought into frictional contact with the film having heat transferable color dye for causing the color dye to be transfered from the film to the receiver by means of the heat produced from the selectively energized heating elements; and

c. a platen for supporting the film and the receiver,

i. an improvement in the thermal head comprising:

ii. a vibration device having an elastic member formed on said heating elements, said vibrating device including

means for vibrating said elastic member which induces a vibration traveling wave in said heating elements; and

iii. the induced vibration wave in said heating elements causes the film and receiver to move in a predetermind direction.

4,797,690

RIBBON FEED MECHANISM

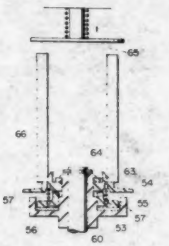
Masaaki Takita, Ibaraki; Yoshikazu Tsuru, Hirakata; Masaharu Ushihara, Hirakata; Taichi Itoh, Hirakata, and Masumi Tanaka, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 29, 1988, Ser. No. 162,409

Claims priority, application Japan, Mar. 4, 1987, 62-49289; Mar. 23, 1987, 62-68409; May 8, 1987, 62-113020

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—105 **9 Claims**



1. A ribbon feed mechanism comprising: first, second and third ribbon feed components fitted on a shaft, a friction plate mounted between said first and second ribbon feed components, a spring mounted between said second and third ribbon feed components, a cylinder which is in contact with said third ribbon feed component at one end thereof, and a ribbon feed presser for pressing the other end of said cylinder toward said third ribbon feed component, wherein said second and third ribbon feed components are mechanically coupled to each other by said spring, the engaging surfaces of said second and third ribbon feed components are toothed, said second and third ribbon feed components are pressed by said spring in a state in which a gap is partially provided between said engaging surfaces, and said third or first ribbon feed component is driven by rotating said first or third ribbon feed component about said shaft.

4,797,691

SIDE PRINTING HEAD ASSEMBLY

Nobuyasu Akiyoshi, and Shigehisa Shimizu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 13, 1987, Ser. No. 85,633

Claims priority, application Japan, Aug. 13, 1986, 61-190008

Int. Cl.[4] G01D *9/42*; G02B *6/26*

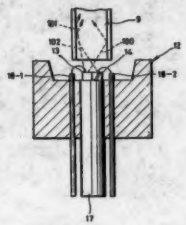
U.S. Cl. 346—108 **6 Claims**

1. A side printing head assembly for printing an optical mark on a photographic material comprising:

a light source comprising a plurality of LED units each of which comprises a plurality of LED elements arranged in a planar array, each of said LED elements emitting one of a plurality of different monochromatic lights;

light guide members as many as said plurality of LED units and superimposed adjacent said array of LED elements of each LED unit, respectively, for directing light from said LED units toward said moving photographic material; and

means for driving the LED elements of each of said plurality of LED units independently of each other so as to provide



a desired color and amount of light for printing said optical mark on said photographic material.

4,797,692

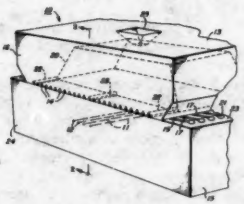
THERMAL INK JET PRINTER HAVING INK NUCLEATION CONTROL

Dale R. Ims, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1987, Ser. No. 92,111

Int. Cl.[4] G01D *15/16*; C09D *11/00*

U.S. Cl. 346—140 R **5 Claims**



1. A thermal ink jet printer having ink nucleation control, comprising:

a printhead having an ink supply reservoir, a plurality of capillary filled ink channels, each communicating at one end with the reservoir and at the other end having an opening which serves as a nozzle, each channel having a bubble generating heating element adjacent but upstream from the nozzle;

means for supplying ink to the printhead reservoir, said ink being an emulsion comprising a water-based ink phase and second liquid disperse phase suspended therein, the second liquid disperse phase having a homogeneous nucleation temperature below the heterogeneous nucleation temperature of the water-based ink phase and being in the form of relatively small droplets suspended throughout the water-based ink phase;

means for selectively applying current pulses representative of digitized data to each of the printhead heating elements to generate thermal energy which is transferred to the ink contacting the heating elements thereby causing the ink to produce temporary bubbles which expel and propel droplets to a recording medium; and

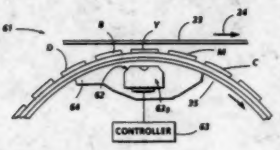
said second liquid disperse phase providing a sufficiently high droplet density per unit volume of ink emulsion to initiate nucleation of the ink emulsion contacting the respectively pulsed heating elements at a temperature below that of water-based inks alone and to grow the bubbles with lower pulse power levels.

4,797,693

POLYCHROMATIC ACOUSTIC INK PRINTING

Calvin F. Quate, Stanford, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1987, Ser. No. 57,874
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 23 Claims



1. An acoustic ink printer for printing polychromatic images on a recording medium, said printer comprising the combination of

a marking solution containing a plurality of different colored liquid inks, said marking solution having a free surface proximate said recording medium, with said different colored inks appearing on said free surface in a predetermined order;

a single acoustic printhead acoustically coupled to said marking solution for launching converging acoustic waves into said marking solution such that the free surface of said marking solution is radiated with focused acoustic energy, whereby radiation pressure is exerted against said surface;

transport means for sequentially bringing the different colored inks of said marking solution into alignment with said printhead; and

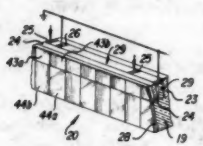
controller means coupled to said printhead means for modulating the radiation pressure exerted against the different colored inks appearing on said free surface in accordance with data representing corresponding color separations of a polychromatic image, whereby droplets of said different colored inks are ejectedon command from said free surface to print said color separations in superimposed registration on said recording medium.

4,797,694

SCAN-MULTIPLEXED LIGHT VALVE PRINTER WITH BAND-REDUCING CONSTRUCTION

John A. Agostinelli, Rochester, and José M. Mir, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1987, Ser. No. 99,954
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 6 Claims



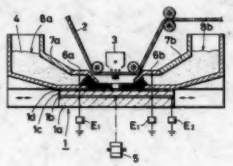
1. In light valve imaging apparatus of the kind having (i) a linear light valve array comprising a plurality of selectively activatible light valve portions having approximately equal linear widths and spaced by intermediate non-transmissive portions, (ii) source means for directing generally uniform illumination through said light valve portions, (iii) means for forming an image of said light valves at a generally linear image zone and (iv) multiplexing means for scan-indexing the image of said light valves along said image zone in a plurality of increments, the improvement comprising source-scan means for scan-indexing the illumination from said source means onto said light valve array in synchronism with the scan-indexing by said multiplexing means.

4,797,695

ELECTROPHOTOGRAPHIC RECORDING SYSTEM

Tetsuro Konno; Yutaka Kanai, and Tetsuya Fujita, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 874,108, Jun. 13, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 105,503
Claims priority, application Japan, Jun. 13, 1985, 60-128498
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 10 Claims



1. An electrophotographic recording apparatus comprising: a transparent substrate having front and rear surfaces; a transparent electrode layer disposed on the front surface of the substrate; a photoconductive layer disposed on the electrode layer; a plurality of floating electrode segments disposed separate from but close to one another on the photoconductive layer; feeding means for feeding electrically charged toner onto the floating electrode segments such that the charged toner is electrostatically attracted onto the floating electrode segments; irradiating means for selectively irradiating an optical beam onto the photoconductive layer from the rear surface of the substrate to establish electrical paths extending through the photoconductive layer at the selectively irradiated portions thereof to thereby selectively electrically connect the floating electrode segments to the electrode layer; supplying means electrically connected to the electrode layer for supplying electric charge having opposite polarity relative to the polarity of the charged toner to the selected floating electrode segments through the electrical paths to inject the electrical charge into the toner attracted to the selected floating electrode segments through the surface thereof to thereby reverse the polarity of the toner; and transferring means for directly transferring the polarity-reversed toner to a printing medium to thereby produce a visible image on the printing medium.

4,797,696

BEAM SPLITTING APPARATUS

Paul C. Allen, Beaverton, and Paul A. Warkentin, Aloha, both of Oreg., assignors to ATEQ Corporation, Beaverton, Oreg.

Continuation of Ser. No. 867,205, May 27, 1986, abandoned, which is a continuation of Ser. No. 758,344, Jul. 24, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 98,565
Int. Cl.[4] G03B *41/00*; G02B *27/14*
U.S. Cl. 354—4 14 Claims

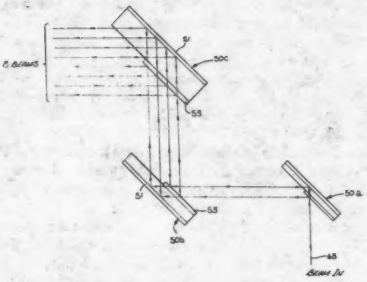
3. An apparatus for generating a pattern on a workpiece, comprising:

a beam generating means for providing a radiant energy beam;

a beam splitting means optically coupled to said beam generation means comprising a first beam splitting mirror for receiving said beam from said laser and for splitting said beam into two beams, said first beam splitting mirror comprising:

a body;

a first reflective layer covering a first portion of a first surface of said body, said body not covered by said first reflective layer on a second portion of said first surface of said body;



a second reflective layer covering at least a second portion of a second surface of said body, said second reflective layer being generally parallel with said first reflective layer.

4,797,697

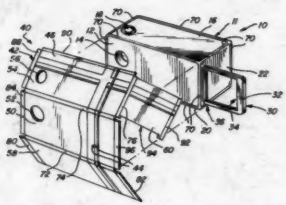
MINIATURE 110 CAMERA WITH FOUR-PANEL WRAPPER

William H. Heuer, Arlington Heights, and Hari Matsuda, Evanston, both of Ill., assignors to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Sep. 14, 1987, Ser. No. 96,618

Int. Cl.[4] G03B *13/04, 17/02*

U.S. Cl. 354—75 **23 Claims**



3. A photographic camera adapted to carry a selcected one of several different appearance-distinguishing indicia, comprising:

A. a housing having a rectangular front wall that includes a lens aperture, a rectangular top wall extending from the top of said front wall and carrying a shutter button for tripping a shutter behind said lens aperture, a rectangular bottom wall extending rearwardly from the bottom of said front wall, and at least one side wall extending between the sides of said front, top and bottom walls, said housing also including a viewfinder and mounting means for pivotally mounting said viewfinder on said housing for rotation between positions substantially lying against one of said walls and extending substantially parallel to said front wall; and

B. a wrapper integrally formed of a sheet of material and presenting inner and outer faces, said inner face carrying an adhesive substance securing said wrapper to said housing by bonding thereto and said outer face being provided with said selected appearance-distinguishing indicia, said wrapper including a front panel, a bottom panel, a top panel and a side panel all carrying said selected indicia, the respective panels conforming to the respective dimensions of said front wall, bottom wall, top wall and side wall and being secured thereto by said adhesive, said front panel having an opening therethrough aligned with said lens aperture to provide clear view for said lens aperture, and said top panel having a passage therethrough aligned with said shutter button for free access to said shutter button.

4,797,698

FILM FEEDING APPARATUS

Kazushige Uenaka, Tokyo; Haruo Takase, Kanagawa; Riuzi Utomo, and Masuo Akimoto, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

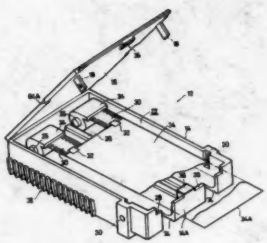
Division of Ser. No. 813,320, Dec. 24, 1985, Pat. No. 4,731,628.

This application Dec. 7, 1987, Ser. No. 129,207

Claims priority, application Japan, Dec. 26, 1984, 59-278989; Dec. 26, 1984, 59-278990; Dec. 26, 1984, 59-278991

Int. Cl.[4] G03B *17/36;* G03D *3/08*

U.S. Cl. 354—275 **7 Claims**



1. A magazine employed when a film accommodated within a film cartridge is fed to a developing machine by using a film feeding apparatus, said magazine comprising:

(a) a magazine body for at least partially enclosing said cartridge;

(b) a cover which covers the interior of said magazine body, said interior being exposed when said cover is raised; and

(c) a film delivery port formed in a part of said magazine body, said magazine body having a space extending toward said port along a direction in which said film in drawable from said cartridge whereby said cartridge is movable within said space, while said cover is closed, from a position away from said silm delivery port to a position close to said port.

4,797,699

FOCAL PLANE SHUTTER

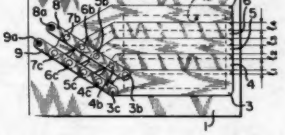
Ichiro Nemoto; Ko Aosaki; Atsushi Misawa, and Takahito Otora, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 146,330

Claims priority, application Japan, Jan. 21, 1987, 62-7218[U]

Int. Cl.[4] G03B *9/40*

U.S. Cl. 354—246 **3 Claims**



1. In a focal plane shutter comprising two sets of parallel

blades positioned between the plane of a lens in a camera and the plane of a film set therein and in a parallel relation thereto, said sets of blades being movable in opposite directions between a first position in which they are unfolded to close a shutter aperature and a second position in which they are folded to form a slit to open said aperature every two adjoining blades in each set of blades having a smaller overlapping width in said first position than in said second position, the improvement wherein said overlapping width in said first position is smaller between two adjoining blades closer to said lens plane than between two adjoining blades closer to said film plane.

4,797,700

DIAPHRAGM DEVICE

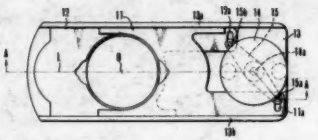
Sadahiko Tsuji, and Hiroyoshi Inaba, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 878,605

Claims priority, application Japan, Jun. 28, 1985, 60-99779[U]; Oct. 30, 1985, 60-243644[U]; Nov. 14, 1985, 60-175530[U]; Nov. 29, 1985, 60-182889[U]

Int. Cl.[4] G03B *9/02*

U.S. Cl. 354—271.1 **3 Claims**



1. A diaphragm device including two diaphragm blades arranged to be movable in parallel relatively to each other along a common line on a plane at right angle to an optical axis of an optical system and having aperture forming cut portions respectively, said diaphragm device further comprising at least one auxiliary diaphragm blade which is movable along said common line on the same plane as the above-mentioned diaphragm blades and has an aperture forming cut portion of the shape different shape from those of the above-mentioned diaphragm blades and amount of relative movement different from those of the above-mentioned diaphragm blades.

4,797,701

APPARATUS FOR THE REMOTE LOCALIZATION OF RADIOACTIVE SOURCES

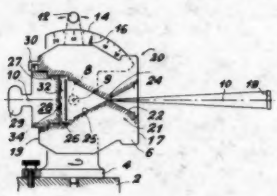
André Lannes, Viroflay, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Dec. 26, 1985, Ser. No. 813,333

Claims priority, application France, Jan. 4, 1985, 85 00088

Int. Cl.[4] G03B *17/02*; G02B *3/00*

U.S. Cl. 354—288 **12 Claims**



12. A portable apparatus for use within a building for the remote localization of radioactive sources, said apparatus operating by exposure and comprising a pinhole camera whose walls constitute a shield for gamma radiation, said pinhole camera having an opening for the introduction of a first film able to detect gamma radiation emitted by said sources and positioned facing said pinhole, a second light-sensitive film being placed in said pinhole camera after removal of said first film in the same location as was occupied by said first film, said second film being sensitive to visible light, said camera having an openable shutter enabling gamma radiation and light to enter through said pinhole and selectively expose said films when contained therein.

4,797,702

FLASH PHOTOGRAPHING SYSTEM

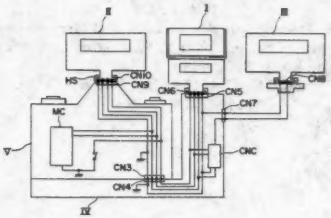
Nobuyuki Taniguchi, Tondabayashi; Hiroshi Hosomizu, Nara; Kenji Tsuji, Kashiwara; Takanobu Omaki, Sennan, and Masaaki Nakai, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

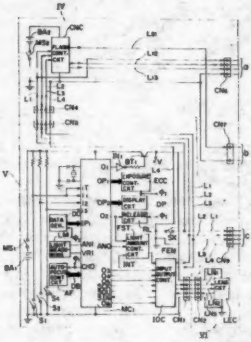
Division of Ser. No. 819,015, Jan. 15, 1986, which is a division of Ser. No. 614,031, May 25, 1984, Pat. No. 4,573,786. This application Feb. 18, 1987, Ser. No. 16,004

Claims priority, application Japan, May 27, 1983, 58-94605; Jun. 1, 1983, 58-98227; Jun. 4, 1983, 58-100050; Jun. 7, 1983, 58-102407; Jun. 10, 1983, 58-104650; Jun. 13, 1983, 58-106424; Jun. 15, 1983, 58-108484; Jun. 17, 1983, 58-109921; Jun. 18, 1983, 58-109854; Jun. 21, 1983, 58-112326; Jun. 23, 1983, 58-113920; Jun. 23, 1983, 58-113921; Mar. 13, 1984, 59-48435

Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—413 **6 Claims**





1. A flash photography system having a camera body and an electronic flash device, comprising:

first to third terminals included in said camera body;

fourth to sixth terminals included in said electronic flash device and connectable to said first to third terminals, respectively;

means in said camera body for producing a distinguishing signal to distinguish between first and second modes, wherein data from said camera body is transmitted to said

electronic flash device in said first mode and data from said electronic flash device is transmitted to said camera body in said second mode, said producing means being connected to said first terminal;

means in said camera body for generating clock pulses to control data transmission between said camera body and said electronic flash device, said generating means being connected to said first terminal;

means in said camera body for reading data from said electronic flash device in response to the clock pulses, said reading means being connected to said second terminal through which the data is serially transmitted from said electronic flash device;

means in said camera body for serially providing data to be transmitted to said electronic flash device in response to said clock pulse, said providing means being connected to said second terminal;

means in said camera body for generating an initiating signal to cause a production of artificial illuminating light from said electronic flash device, said initiating signal generating means being connected to said third terminal;

means in said electronic flash device, for selecting between the first and second modes in response to said distinguishing signal, said selecting means being connected to said fourth terminal;

means in said electronic flash device for serially providing data to be transmitted to said camera body in response to said clock pulses coming through said fourth terminal, said providing means in said electronic flash device being connected to said fifth terminal;

means in said electronic flash device for reading data from said camera body in response to said clock pulses coming through said fourth terminal, said reading means in said electronic flash device being connected to said fifth terminal; and

means in said electronic flash device for causing the production of artificial illuminating light in response to said initiating signal, said initiating means being connected to said sixth terminal.

4,797,703

MECHANISM FOR LOCATING A FLEXIBLE PHOTOCONDUCTOR RELATIVE TO A PLURALITY OF DEVELOPMENT STATIONS

Vladimir S. Guslits, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,861
Int. Cl.[4] G03G *15/06, 15/01*
U.S. Cl. 355—3 DD **4 Claims**

1. In a reproduction apparatus having a flexible photoconductor, means supporting the photoconductor for movement along a path, the photoconductor having first and second surfaces with the first surface being adapted to have latent images formed thereon, and first and second development stations positioned along the path adjacent the first surface of the photoconductor for applying developer material to the latent images thereon, a mechanism for deflecting the photoconductor into a position for receiving developer material from the first station or the second station comprising:

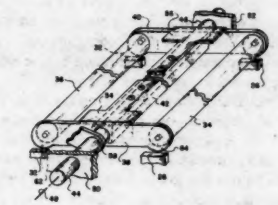
means defining two spaced stops on each of the development stations,

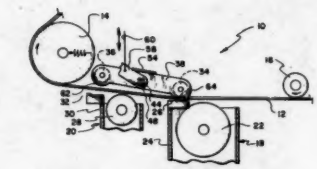
first and second back-up rollers adjacent the second surface of the photoconductor, the rollers being spaced from each other,

means mounting the rollers for conjoint movement about an axis located between the rollers,

means for moving the back-up rollers between (1) a first position wherein the first roller engages and deflects the photoconductor into a position relative to the first development station to permit developer material from such stations to be applied to a latent image on the photoconductor, and (2) a second position wherein the second roller engages and deflects the photoconductor in a position relative to the second development station to permit developer material from the second station to be applied to a latent image on the photoconductor,

means associated with the mounting means for limiting movement of the back-up rollers, the limiting means comprising first means on the mounting means engageable





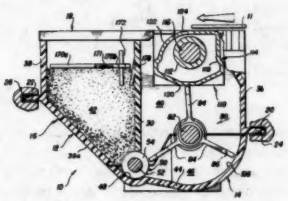
with the stops on the first development station when the back-up rollers are moved to their first position and second means on the mounting means engageable with the stops on the second development station when the back-up rollers are moved to their second position.

4,797,704

DISPOSABLE DEVELOPMENT STATION HAVING MEANS FOR ASSISTING IN THE FEEDING OF THE TONER SUPPLY AND PREVENTING REPLENISHMENT OF THE TONER SUPPLY

Lawrence A. Hill, Rochester; Michael E. Jacobs, Henrietta; Arthur S. Kroll, Rochester; Ralph E. Williams, Rochester, all of N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,200
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—3 DD **6 Claims**



1. A disposable development station for developing latent images on a photoconductor in a copier or printer, the station comprising:

an elongate housing having a plurality of walls defining first and second chambers with one of the walls comprising a vertically orientated separating wall extending longitudinally of the housing and separating the first and second chambers, the first chamber having an opening at the top, the second chamber being adapted to receive a single supply of toner particles for developing latent images;

means at the bottom of the separating wall for feeding toner particles from the second chamber to the first chamber;

toner applying means located in the first chamber relative to the opening to provide toner particles to a latent image adjacent the opening;

the walls defining the second chamber substantially fully enclosing the second chamber and being permanently secured together so that the supply of toner particles in the second chamber cannot be replenished after it has been fed from the chamber by the feeding means, whereby the useful life of the station is determined by the single supply of toner particles in such chamber; and

a plate positioned above and resting on the toner particles in said second chamber, the plate initially being in a first position in the upper portion of the chamber, and the plate being movable downwardly with the toner particles to a second position in the lower portion of the chamber as the feeding means removes toner particles from the second chamber.

4,797,705

IMAGE FORMING APPARATUS HAVING A HIGH-VOLTAGE UNIT MALFUNCTION DETECTING FUNCTION

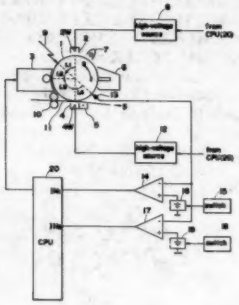
Nobuaki Nishioka, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1987, Ser. No. 10,476

Claims priority, application Japan, Feb. 4, 1986, 61-22767

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 CH **13 Claims**



1. An image forming apparatus comprising:

a photosensitive member;

means for charging the photosensitive member;

means for forming an electrostatic latent image on the photosensitive member charged by the charging means;

reversal development means for developing said latent image with a toner of the same polarity as the latent image;

means for transferring the toner image from the photosensitive member to a paper;

a sensing means for detecting the amount of the toner adhering to the photosensitive member or on the paper; and

means for detecting a malfunction in the charging means or in the transferring means based on an output from the sensing means.

4,797,706

MULTI-UNIT IMAGE PROCESSING SYSTEM WITH CENTRAL CONTROL

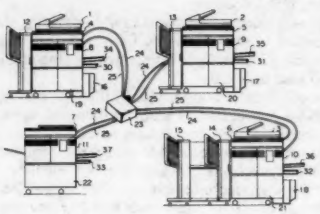
Kiyohisa Sugishima, Yokohama, and Masanori Yamada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,536

Claims priority, application Japan, Feb. 28, 1985, 60-039043; Feb. 28, 1985, 60-039045

Int. Cl.[4] G03G *15/00*; H04N *1/00*

U.S. Cl. 355—14 R **20 Claims**



1. An image processing system comprising:

means for supplying an image signal;

a plurality of image forming means for forming images in accordance with the image signal from said supplying means;

means for inputting a number of images to be formed;

means for setting an image formation mode for forming images on both sides of a recording medium;

means for selecting at least one of said image forming means having a two-sided copy function for image formation in accordance with the mode set by said setting means; and

means for discriminating as to whether or not the selected image forming means having a two-sided copy function is or are capable of forming a number of images equal to the inputted number of images.

4,797,707

IMAGE FORMING APPARATUS

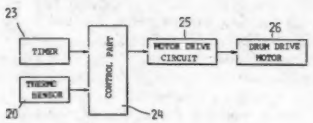
Haruo Iwahashi, and Kazuhiro Nakazawa, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,359

Claims priority, application Japan, Dec. 23, 1986, 61-305291

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **9 Claims**



1. Image forming apparatus comprising

a photosensitive member being rotatable for forming latent image thereon,

said photosensitive member having an electric capability of establishing electric potential thereon by being subjected to electrification and having a fatigue characteristic in which the electric capability changes with respect to operation period and the changed electric capability recovers with respect to rest time period,

a means for judging the rest time period,

a means for detecting temperature of said photosensitve member,

a means for providing fatigue to said photosensitive member in order to change the electric capability,

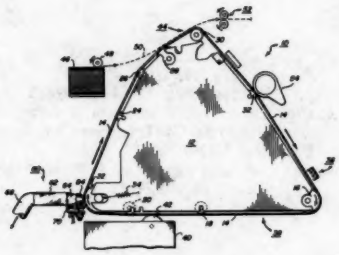
a means for controlling said fatigue providing means based on the rest period and the temperature.

4,797,708

APPARATUS FOR SCAVENGING UNWANTED PARTICLES FROM A PHOTOCONDUCTOR OF AN ELECTROGRAPHIC APPARATUS

W. Charles Kasiske, Jr., and John M. Fiske, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1987, Ser. No. 45,931
Int. Cl.[4] G03G 21/00, 15/00
U.S. Cl. 355—15 3 Claims



1. In electrographic apparatus having a plurality of rollers guiding an endless flexible photoconductor along a path past a series of stations including an imaging station at which a latent image is formed on the photoconductor, a development station at which the latent image is developed with toner particles, and a transfer station at which the developed image is transferred to a receiver sheet, one of the rollers guiding the photoconductor being located between the development station and the transfer station, spring means for urging the one roller toward the photoconductor to tension the photoconductor, the improvement comprising:

a vacuum plenum having (a) an elongate entrance slot through which air can be drawn into the plenum and (b) an exit opening adapted to be connected to a source of negative pressure;

means for mounting the plenum adjacent the one roller, the mounting means comprising at least one pin slidably supporting the plenum, and spring means for urging the plenum toward the one roller, the plenum being positioned on the mounting means with the slot facing and adjacent the one roller; and

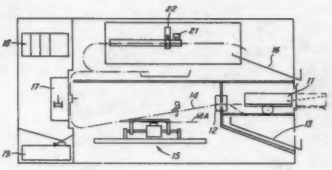
a plurality of tires carried by the plenum and engageable with end portions of the one roller for limiting movement of the plenum slot toward the one roller by the spring means, wherein the one roller of the electrographic apparatus is movable away from the photoconductor into a retracted position for removing tension on the photoconductor, and the improvement further comprises stop means for limiting movement of the plenum toward the one roller by the spring means when the one roller is in its retracted position, thereby providing sufficient space between the one roller and the plenum for replacement of the photoconductor.

4,797,709

INTEGRATED SCANNER/PLOTTER FOR MICROFILM APERTURE CARDS

Robert A. D. Brash, Fishers Pond; Anthony J. Wicks, Meadow Cottage, and Eric T. Wilson, Medstead, all of United Kingdom, assignors to Wicks & Wilson Limited, Basingstoke, United Kingdom

Filed Oct. 8, 1987, Ser. No. 106,147
Claims priority, application United Kingdom, Oct. 9, 1986, 8624263
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—27 15 Claims



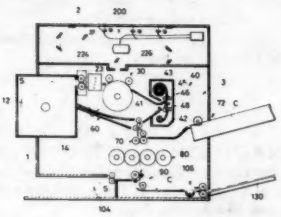
1. A microfilm aperture card handling machine having punched card reading and punching means, single means capable of both scanning and plotting microfilm images, a photographic developer station for developing plotted images, and control means enabling selective operation to read existing data carried by a card or to create data on a previously blank card.

4,797,710

HEAT DEVELOPING DEVICE

Minoru Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1987, Ser. No. 129,196
Claims priority, application Japan, Dec. 5, 1986, 61-289058
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—27 7 Claims



1. A heat developing device for use with an image recorder of the type in which an image is exposed onto a thermally developable sensitive medium and is therefter developed, and the developed image is transferred to an image-receiving material by overlapping the sensitive material and the image-receiving material on each other, said device comprising:

a belt having heating means incorporated therein;

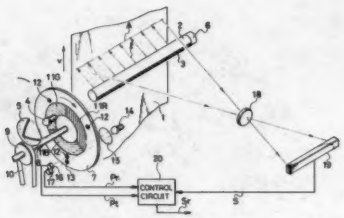
means for delivering said sensitive material into contact with said belt; and

a take-up roll rotatable in a first direction to roll up said belt and sensitive material for development of said sensitive material and rotatable in a second direction to unroll said belt and sensitive material from said take-up roll.

4,797,711
IMAGE SCANNING APPARATUS

Shigeru Sasada; Masahiro Yamamoto, both of Kyoto; Yoshio Shimizu, Osaka, and Tsutomu Sumioka, Kyoto, all of Japan, assignors to Dainippon Screen Mfg., Co., Ltd., Japan

Filed Sep. 9, 1987, Ser. No. 94,519
Claims priority, application Japan, Sep. 10, 1986, 61-137800[U]; Sep. 19, 1986, 61-142528[U]; Nov. 12, 1986, 61-172705[U]; Feb. 9, 1987, 62-16601[U]
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—32 3 Claims



1. A linear light source for use in an image scanning apparatus, said light source comprising:

(a) a cylindrical rod made of a transparent material which is arranged in parallel with a picture plane of an original picture to be scanned;

(b) an elongated strip-like diffused reflection layer provided on said cylindrical rod along a longitudinal axis of said cylindrical rod; and

(c) light means directing light fluxes into one side end of said cylindrical rod, said light means comprising:

(1) a lamp;

(2) a concave mirror which reflects light fluxes emitted from said lamp into one side end of said rod so as to cause light fluxes to enter into said cylindrical rod through said one side end;

(3) a filtering device for selectively placing any one of a plurality of color filters between said one side end of said cylindrical rod and said lamp; and

(4) a control device for generating a control pulse each time a different said color filter is placed between said lamp and said one side end of said cylindrical rod and generating a control pulse during each changing period of said filtering device.

4,797,712
COLOR NEGATIVE INSPECTION APPARATUS

Ryoichi Hayashi, Tokyo; Kiichiro Sakamoto, and Takaaki Terashita, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1987, Ser. No. 61,612
Claims priority, application Japan, Jun. 13, 1986, 61-137668
Int. Cl.[4] G03B 27/80
U.S. Cl. 355—38 10 Claims

1. A color negative inspection apparatus comprising:

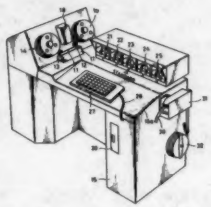
means for providing a plurality of different printing exposure control modes, each defining a standardized printing exposure condition;

means for reading a color negative image on a single frame of a color negative film;

memory means for storing image data of said color negative image read by said reading means;

means for selecting any one of said plurality of different printing exposure control modes; and

means for displaying at least one simulated color positive image based on said image data read out from said memory means and a standardized printing exposure condition

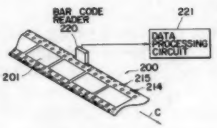


according to said selected one of said plurality of different printing exposure control modes.

4,797,713
PHOTOGRAPHIC PRINTING METHOD

Takaaki Terashita, and Hideaki Iijima, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 3, 1987, Ser. No. 81,098
Claims priority, application Japan, Aug. 4, 1986, 61-183072
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—77 9 Claims



1. A photographic printing method which comprises the steps of:

maintaining a storage of preprocessed exposure correction data and preprocessed image characteristic data for each representative one of a plurality of image frames having been previously processed, each respective preprocessed exposure correction data being related to a respective frame image by a respective preprocessed image characteristic data;

subjecting an image frame on a negative film having an image to be printed, to a photometry operation for obtaining processing image characteristic data and processing exposure correction data for said image frame;

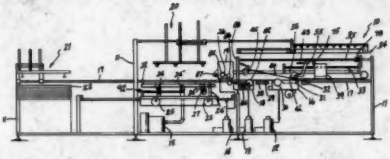
determining whether preprocessed exposure correction data is currently being stored for said image frame of said negative film by comparing said processing image characteristic data to said preprocessed image characteristic data; and

printing said image frame of said negative film by utilizing said preprocessed exposure correction data when a result from said comparison determines that data is currently being stored for said image frame, and by utilizing said processing exposure correction data when a result from said comparison determines that data is not currently being stored for said image frame.

4,797,714
MASTER AND MASTER TRANSPORT ASSEMBLY REGISTRATION SYSTEM

David P. Bujese, Butler, N.J., assignor to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Filed Jan. 7, 1988, Ser. No. 141,564
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—77 28 Claims



1. A method of registering a flexible web to a rigid support station, the flexible web being usable to accurately and repeatably transfer a developed image to a receiving surface, the receiving surface being supported by the rigid support station, comprising the steps of:

(a) placing a master on the rigid support station;

(b) aligning the master in a fixed position on the rigid support station;

(c) securing the aligned master in the fixed position on the rigid support station;

(d) moving the flexible web to a position opposite the secured master;

(e) aligning the flexible web with the secured master;

(f) registering and securing the flexible web with the secured master and the rigid support station;

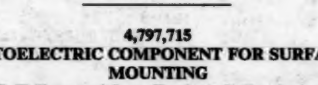
(g) taking the aligned master from the rigid support station and securely placing it onto the registered flexible web; and

(h) removing the flexible web with the master attached from opposite the rigid support station.

4,797,715
OPTOELECTRIC COMPONENT FOR SURFACE MOUNTING

Jacques C. Thillays, and Jean-Claude A. Vallee, both of Herouville, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,550
Claims priority, application France, Nov. 5, 1985, 8516374
Int. Cl.[4] H01L 33/00, 29/06, 27/14, 29/04
U.S. Cl. 357—17 8 Claims

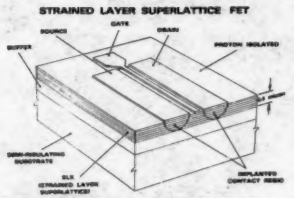


1. An optoelectronic component comprising a highly doped silicon substrate of a first conductivity type having upper and lower surfaces orientated along the plane (100) and an optoelectronic element disposed on the bottom of a first cavity provided in said substrate, the surface of the first cavity being coated with a metallic layer such that it becomes reflective and said cavity having four faces disposed along (111) planes inclined with respect to the upper surface and a flat bottom also coated with the metallic layer, the optoelectronic element having a first electrode comprising a zone of the first conductivity type soldered at said flat bottom on the metallic layer and a second electrode comprising a zone of the second conductivity type connected electrically to the upper surface of the substrate, said component comprising a second cavity having dimensions smaller than those of the first cavity and having a surface extending from the lower surface of the substrate to an opening of said flat bottom, the first and second cavities having a region of the second conductivity type opposite to the first conductivity type adjacent to their surfaces, the second electrode being connected to the upper surface of the substrate by means of a first conductive layer for surface mounting of the component on the surface of said first cavity, and the lower surface of the substrate comprising a second conductive layer in electrical contract with the region of the second conductivity type and a third conductive layer in electrical contact with the substrate.

4,797,716
FIELD-EFFECT TRANSISTOR HAVING A SUPERLATTICE CHANNEL AND HIGH CARRIER VELOCITIES AT HIGH APPLIED FIELDS

Roger J. Chaffin, deceased, late of Albuquerque (by Nancy Davis, legal representative); Ralph Dawson, Albuquerque; Ian J. Fritz, Albuquerque; Gordon C. Osbourn, Albuquerque, and Thomas E. Zipperian, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 602,109, Apr. 4, 1984, abandoned. This application Jun. 8, 1987, Ser. No. 59,365
Int. Cl.[4] H01L 29/80
U.S. Cl. 357—22 9 Claims



8. A field-effect transistor having a source, a drain, a channel and a gate in operational relationship, said channel consisting of a semiconductor being a strained layer superlattice comprising alternating lattice-mismatched quantum well and barrier layers;

said quantum well layers being selected of a material having:

an energy difference greater than 0.3 eV, the value of GaAs, between the lowest energy level in L_{2D} valleys and the lowest energy level in $L_{(a-D)}$ valleys; and

a bandgap value less than 1.424 eV, the value of GaAs;

said barrier layers being selected of a material having a L-valley energy level greater than the L-valley energy of the quantum well material;

the thickness of said quantum well layers being less than about 100 angstroms, the thickness of said barrier layers being in the range of 50–400 angstroms.

4,797,717
SEMICONDUCTOR MEMORY DEVICE

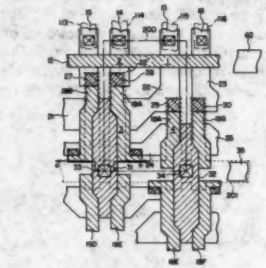
Koichiro Ishibashi; Osamu Minato; Toshiaki Masuhara, all of Tokyo; Yoshio Sakai, Kanagawa; Toshiaki Yamanaka, Houya; Naotaka Hashimoto, Hachioji; Shoji Hanamura, Kokubunji; Nobuyuki Moriwaki, Kodaira; Shigeru Honjyo, and Kiyotsugu Ueda, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

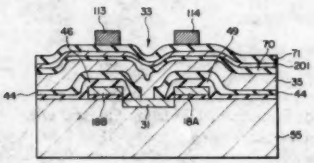
Filed Apr. 17, 1987, Ser. No. 39,291
Claims priority, application Japan, Apr. 18, 1986, 61-88233
Int. Cl.[4] H01L 29/78, 27/02, 29/04
U.S. Cl. 357—23.1 7 Claims

1. A semiconductor memory device comprising:

a plurality of memory cells formed on a principal surface of a semiconductor substrate, where each of said memory cells is defined by a substantially square cell region which has first, second, third and fourth sides, said first and second sides being disposed so as to be in substantially parallel to each other, said third and fourth sides being

disposed so as to be in substantially parallel to each other, each of said memory cells including two transfer gate MOS transistors, two driver MOS transistors and two load resistances, said two transfer gate MOS transistors in each of said memory cells being disposed in the vicinity of said first side, said two transfer gate MOS transistors in each of said memory cells having gate electrodes formed from a first electrode wiring layer disposed substantially parallel to said first side, said two driver MOS transistors in each of said memory cells having gate electrodes formed from second and third electrode wiring layers which are formed simultaneously with said first electrode wiring layer, said first, second and third electrode wiring layers being defined by a first-level conductive layer provided on said principal surface of said semiconductor substrate, said two driver MOS transistors in each of said





memory cells having source regions respectively disposed in the vicinity of said third side and in the vicinity of said fourth side, each of the source regions of said two driver MOS transistors in each of said memory cells being connected to a fourth conductive layer as a second-level conductive layer formed on said first-level conductive layer, said fourth conductive layer being connected to a first operating potential point, said two load resistance in each of said memory cells being formed from a high-resistance material layer formed as a third-level layer on said second-level conductive layer, said two load resistances in each of said memory cells each having one end thereof connected to said gate electrode of the corresponding one of said two driver MOS transistors, and the other ends of said two load resistances being connected to a second operating potential point which is different from said first operating potential point.

4,797,718

SELF-ALIGNED SILICON MOS DEVICE

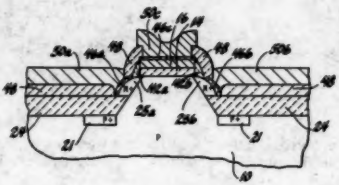
Peter J. Schubert, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Division of Ser. No. 939,183, Dec. 8, 1986, Pat. No. 4,714,685. This application Sep. 14, 1987, Ser. No. 95,868

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **1 Claim**

1. An MOS transistor including a silicon body which includes an upper portion, a middle portion, and a lower portion, the upper portion including an intermediate channel portion and laterally grown epitaxial regions, the intermediate channel portion being of one conductivity type and located between the laterally grown epitaxial regions which are doped to be of an opposite conductivity type for serving as the respective source and drain regions of the transistor, the middle portion including a tapered portion which is contiguous with the intermediate channel portion, the tapered portion being encircled by a layer of silicon oxide which is sandwiched between the lower portion and the doped regions of the upper portion, the lower portion including an intermediate substrate portion and laterally disposed field implants, the intermediate substrate



portion being contiguous with the tapered portion, the laterally disposed field implants being adjacent to the layer of silicon dioxide and being the same conductivity type as the intermediate substrate portion but more heavily doped than the intermediate substrate portion, the tapered portion included within the middle portion and the intermediate substrate portion included within the lower portion being of the one conductivity type, and a gate region dielectrically isolated from the silicon body and overlying the surface of the intermediate channel portion.

4,797,719

MOS CAPACITOR WITH DIRECT POLYCRYSTALLINE CONTACT TO GROOVED SUBSTRATE

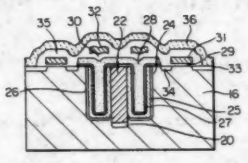
Seiji Ueda, Otsu, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 846,902, Apr. 1, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,177

Claims priority, application Japan, Apr. 3, 1985, 60-70278

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.6 **10 Claims**



1. A MOS capacitor comprising:

a semiconductor substrate having a principal surface and a pair of spaced trenches formed in said principal surface, each of said trenches being defined by side walls, having first and second parts, and a bottom, said first parts of the side walls and the bottoms of said trenches being inner surfaces of said substrate;

an isolation region embedded in said semiconductor substrate only between said pair of trenches, said isolation region having a pair of side walls which extend in a direction substantially perpendicular to the principal surface of said substrate and define said second parts of the side walls of said trenches;

first polycrystalline silicon films formed within each of said trenches directly on said first parts, said second parts and said bottoms of said trenches, said first polycrystalline films serving as a first electrode of said MOS capacitor;

insulating films formed on said first polycrystalline films, said insulating films constituting dielectric layers of said MOS capacitor; and

a second polycrystalline silicon film formed on said insulating films, said second polycrystalline film serving as a second electrode of said MOS capacitor, whereby said first polycrystalline silicon films are disposed entirely between the bottoms of said trenches and said insulating films.

4,797,720

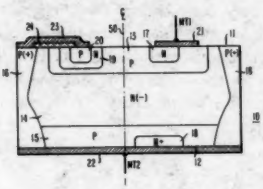
CONTROLLED BREAKOVER BIDIRECTIONAL SEMICONDUCTOR SWITCH

Richard Lindner, Bethlehem, and Bertram R. Rex, Lehighton, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 29, 1981, Ser. No. 288,001

Int. Cl.[4] H01L *29/747*

U.S. Cl. 357—39 **11 Claims**



1. A bidirectional semiconductor switching device comprising a body of silicon semiconductor material having first and second major surfaces and having a first portion including a switching element and a second portion integral therewith including a bidirectional voltage-sensitive breakdown element, and further comprising means connecting said breakdown element as a gating element to said switching element for triggering conduction in either direction therein, CHARACTERIZED in that said breakdown element includes three zones of alternating conductivity type, the zones having a common surface coincident with the first major surface and comprising a first terminal zone, an intermediate zone, and a second terminal zone, with the first terminal zone being encompassed by the intermediate zone and the intermediate zone being encompassed by the second terminal zone, and further characterized in that the second portion includes a section of relatively higher conductivity at the intersection of the boundary between the intermediate zone and the second terminal zone, and the first major surface, whereby a desired breakdown voltage between said first terminal zone and said second terminal zone for triggering said conduction in said switching element is achieved.

4,797,721

RADIATION HARDENED SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,482

Int. Cl.[4] H01L *27/12, 29/78*

U.S. Cl. 357—23.7 **13 Claims**

1. A semiconductor device, comprising:

an insulating substrate,

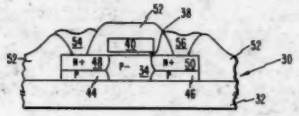
a layer of semiconductor material of a first conductivity type disposed on said insulating substrate;

a gate insulating layer disposed over said layer of semiconductor material;

a gate electrode disposed over said gate insulating layer;

source and drain regions of a second conductivity type disposed in said layer of semiconductor material, said source and drain regions having a depth less than the thickness of said layer of semiconductor material;

a first region of a first conductivity type having an impurity concentration greater than the impurity concentration of



said layer of semiconductor material disposed in said layer of semiconductor material between said source region and said substrate and subtending said source region; and

a second region of a first conductivity type having an impurity concentration greater than the impurity concentration of said layer of semiconductor material disposed in said layer of semiconductor material between said drain region and said substrate and subtending said drain region.

4,797,722

HOT CHARGE-CARRIER TRANSISTORS

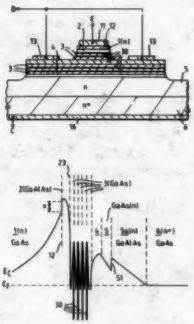
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1987, Ser. No. 46,974

Claims priority, application United Kingdom, May 23, 1986, 8612603

Int. Cl.[4] H01L *29/72, 29/205*

U.S. Cl. 357—34 **11 Claims**



1. A hot charge-carrier transistor comprising a base region through which current flow is by hot majority charge-carriers of one conductivity type, barrier-forming means which forms with the base region an emitter-base barrier serving for injection of the hot charge-carriers of said one conductivity type into the base region, and a base-collector barrier for collecting the hot charge-carriers of said one conductivity type from the base region during operation of the transistor, wherein the base region comprises alternate layers of semiconductor material of said one conductivity type and of metal-based material of higher conductivity than that of the semiconductor material, one of the semiconductor layers of the base region adjoins the base-collector barrier so that each metal-based layer of the base region is separated from but extends substantially parallel to the base-collector barrier, and each metal-based layer in the vicinity of the emitter-base barrier and each metal-based layer in the vicinity of the base-collector barrier is sufficiently thin to

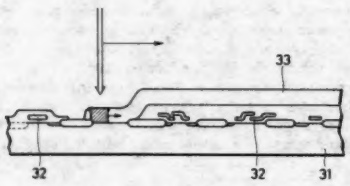
permit quantum mechanical tunnelling, having a thickness of less than or equal to 1 nm, thereby aiding efficient transmission of the hot charge-carriers through the base region and over the base-collector barrier.

4,797,723

STACKED SEMICONDUCTOR DEVICE

Tadashi Nishimura, and Yoichi Akasaka, both of Hyogo, Japan, assignors to Mitsubishi Denki, K.K., Itami, Japan

Continuation of Ser. No. 812,600, Dec. 23, 1985, abandoned, which is a continuation of Ser. No. 444,093, Nov. 24, 1982, abandoned. This application Sep. 8, 1987, Ser. No. 96,212
Claims priority, application Japan, Nov. 25, 1981, 56-191118
Int. Cl.[4] H01L *27/02, 29/06, 29/04, 29/78*
U.S. Cl. 357—40 **6 Claims**



1. A stacked semiconductor device comprising:

a first semiconductor layer having formed at least partially therein a first plurality of active integrated circuit elements containing a large number of circuit elements and at least one additional coplanar complete active integrated circuit having a relatively high heat generating capacity to thereby provide said stacked semiconductor device with an improved heat dissipating ability, said first plurality of elements and said one additional circuit forming a first integrated circuit;

an insulating layer formed upon and continuously and uniformly contacting and covering all of said first plurality of elements and leaving exposed all of said one additional circuit; and

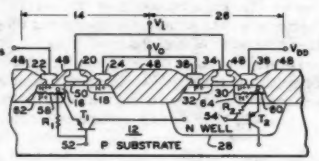
a second semiconductor layer formed upon and continuously and uniformly covering and contacting said insulating layer and leaving exposed all of said one additional integrated circuit and having formed at least partially therein a second plurality of active integrated circuit elements, said second plurality of elements forming a second integrated circuit.

4,797,724

REDUCING BIPOLAR PARASITIC EFFECTS IN IGFET DEVICES

Clifford H. Boler, New Hope; Marc D. Hartranft, Brooklyn Park, and Thomas E. Hendrickson, Wayzata, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1982, Ser. No. 393,891
Int. Cl.[4] H01L *27/04, 29/78*
U.S. Cl. 357—42 **3 Claims**



1. A solid state device, comprising:

a substrate of a substantially monocrystalline semiconductor material including a principal surface, said principal surface having a substantially flat portion;

an insulating material overlying part of said flat portion;

a first region in said substrate extending into said substrate from said principal surface and being doped with a first conductivity type;

second and third regions in said substrate wherein said second and third regions are spaced apart from each other along said flat portion by a part of said first region, said second and third regions each extending into said substrate from said principal surface and each being doped with a second conductivity type, and wherein said second and third regions form first and second junctions, respectively, of said first and second conductivity types within said substrate, and wherein at least a part of each of said first and second junctions intercepts said flat portion;

a first conductive means overlying at least a part of said space between said second and third regions and being separated from said flat portion by said insulating material;

a fourth region in said substrate at said first junction wherein said monocrystalline material is damaged to an extent sufficient to provide a low resistivity path through said first junction, the resistivity of said low resistivity path being lower than the resistivity of said first junction when said first junction is undamaged and unbiased by electrical potentials, and wherein said fourth region is separated from said flat portion by said substrate;

a fifth region in said substrate extending into said substrate from said principal surface and being doped with said second conductivity type;

sixth and seventh regions in said substrate wherein said sixth and seventh regions are spaced apart from each other along said flat portion by a part of said fifth region, each extend into said substrate from said principal surface and each are doped with said first conductivity type, and wherein said sixth and seventh regions from third and fourth junctions, respectively of said first and second conductivity types with said fifth region, and wherein at least a part of each of said third and fourth junctions intercepts said flat portion;

a second conductive means overlying said space between sixth and seventh regions and being separated from said flat portion by said insulating material;

an eighth region in said substrate at said third junction wherein said monocrystalline material is damaged to an extent sufficient to provide a second low resistivity path through said third junction, the resistivity of said second low resistivity path being lower than resistivity of said third junction when said third junction is undamaged and unbiased by electrical potentials, and wherein said eighth region is separated from said flat portion by said substrate;

a ninth region in said substrate, adjacent to said fourth region and on the opposite side of said first junction from said second region, said ninth region being heavily doped with said first conductivity type and separated from said flat portion by said substrate; and

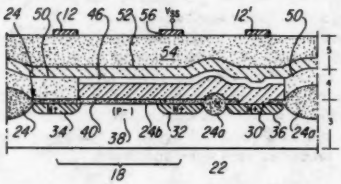
a tenth region in said substrate adjacent to said eighth region and on the opposite side of said third junction from said sixth region, said tenth region being heavily doped with said second conductivity type and separated from said flat portion by said substrate.

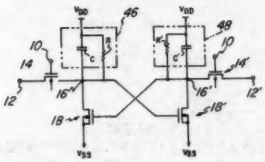
4,797,725

MEMORY CELL FOR SRAM WITH A DIELECTRIC LAYER OVER A GATE ELECTRODE TO PROVIDE A PARALLEL RESISTIVE AND CAPACITIVE ELEMENT

Masashi Hashimoto, Miho, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 15, 1985, Ser. No. 798,656
Claims priority, application Japan, Nov. 26, 1984, 59-249296
Int. Cl.[4] H01L 29/34, 27/02, 29/78, 29/04
U.S. Cl. 357—54 7 Claims





1. A static memory cell in a semiconductor substrate, comprising:

a plurality of doped regions in said substrate, providing source and drain regions of first and second field-effect transistors, said doped regions being spaced to provide respective a channel region for each of said first and second field-effect transistors,

thin insulating layers each over a respective one of said channel regions,

first and second gate electrodes over said thin insulating layers, respectively, the first gate electrode being connected to the drain region of the second field-effect transistor and the second gate electrode being connected to the drain region of the first field-effect transistor,

first and second circuits each comprising a resistance and capacitance connected in parallel, the first circuit being coupled betweem a supply voltage and the drain region of said first field-effect transistor, and the second circuit being coupled between the supply voltage and the drain region of said second field-effect transistor, each of said circuits comprising a highly dielectric layer formed directly on each of said gate electrode layers.

4,797,726

LEAD FRAME INCLUDING DEFORMABLE PLATES

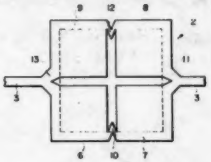
Masamichi Manabe, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,611
Claims priority, application Japan, Feb. 10, 1981, 56-18676
Int. Cl.[4] H01L 23/48, 23/12
U.S. Cl. 357—70 9 Claims

1. A lead frame of the type having a chip fixing plate for supporting an electronic part in a device wherein said electronic part is fixed to said chip fixing plate and the electronic part and chip fixing plate are subsequently subjected to heat, e.g., in a resin encapsulation process, said chip fixing plate comprising:

a plurality of supporting plate portions to which said electronic part is to be fixed; and

a plurality of readily deformable plate portions coupling said supporting plate portions to one another and for deforming to allow said supporting plate portions to move with respect to one another to compensate for differences in thermal expansion of said electronic part and chip fixing plate when said electronic part and chip fixing plate are



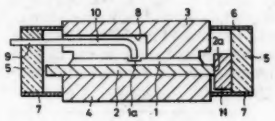
subjected to heat, said readily deformable plate portions each comprising belt-shaped plate portions each having first and seconds ends respectively coupled to adjacent supporting plate portions, each said belt-shaped plate portion having a bent portion intermediate said first and second ends and bent at a predetermined angle, said belt-shaped portions being readily deformable to vary said angle to allow adjacent supporting plates to move with respect to one another.

4,797,727

THYRISTOR WITH ALIGNED TRIGGER GUIDE

Kazuhiko Niwayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,510
Claims priority, application Japan, Aug. 12, 1982, 57-141456
Int. Cl.[4] H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 14 Claims



1. A thyristor, comprising:

a thyristor element having a first electrode and a trigger section (1*a*) formed in the center of one principal surface thereof for receiving trigger signals;

a reinforcing metal disk (2), the first principal surface of which is secured to the other principal surface of said element thereby forming a second electrode, the periphery of said disk being unsecured to said element and comprising at least three faces (2*a*) spaced from the center of said trigger section by a predetermined distance;

a first electrode unit (3) connected to the first electrode formed on said one principal surface of the element;

a second electrode unit (4) connected to the second principal surface of said reinforcing metal disk;

an insulating tube (5) surrounding said element;

a trigger signal guide (10) in the form of a rod for directing trigger signals to said trigger section, one end of said signal guide being adjacent to said trigger section and the other end of which penetrates said insulating tube and is fixed thereto; and

positioning members (11) that abut the faces on said reinforcing metal disk for positioning said metal disk within said insulating tube,

wherein said positioning members each have a form such that the thickest part is slightly wider than a difference

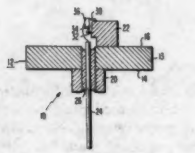
between the radius of the inner circumference of the insulating tube and a distance between each cut face and the center of the trigger section.

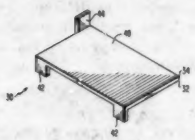
4,797,728

SEMICONDUCTOR DEVICE ASSEMBLY AND METHOD OF MAKING SAME

Anil R. Dholakia, Cranbury Township, Middlesex County, and Louis Trager, Raritan Township, Somerset County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,077
Int. Cl.[4] H01L *23/02*
U.S. Cl. 357—81 **4 Claims**





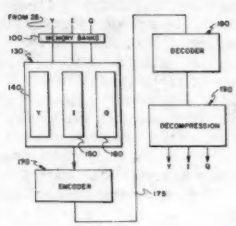
1. A semiconductor device assembly comprising:
a header;
a mounting plate composed of an electrically conductive material about 250 micrometers or less in thickness having opposed first and second major mounting surfaces and a leading edge surface extending therebetween with a first mounting surface attached to said header;
a means for positioning said mounting plate relative to said header attached to said mounting plate; and
a semiconductor device having an end face attached to said second mounting surface wherein said end face is substantially coplanar with said leading edge surface.

4,797,729

SYSTEM INCORPORATING AN ERROR TOLERANT PICTURE COMPRESSION ALGORITHM

Yusheng T. Tsai, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,793
Int. Cl.[4] H04N *7/13, 11/04*
U.S. Cl. 358—13 **10 Claims**



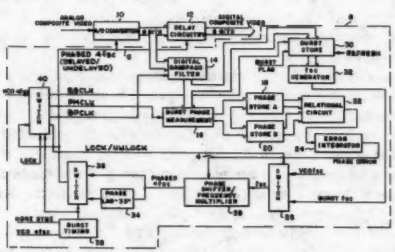
1. A method for processing Y, I and Q color plane image signals representing pixel values, comprising the steps of:
(a) grouping the Y color image plane elements into groups of four 2×2 blocks with each element formed from the average value of 4 neighboring pixels values;
(b) grouping I color image plane elements into one 2×2 block with each element formed from the average value of 4 neighboring pixels values;
(c) computing an average threshold value for each Y and I block of picture elements;
(d) generating a bitmap of one value for each associated picture element equal to or above the average threshold value and of another value for each picture element having a value below the average threshold value;
(e) generating a Hi average signal for the picture elements associated with said one bitmap value;
(f) generating a Lo average signal for the picture elements associated with said another bitmap value;
(g) average all of the elements of one 4×4 group of Q color image plane elements to provide a $Q_{avg.}$ signal;
(h) quantizing said Hi, Lo and $Q_{avg.}$ signals; and
(i) encoding said quantized signals and said generated bitmaps for compressed signal processing.

4,797,730

METHOD AND APPARATUS FOR CONTROLLING THE SAMPLING PHASE OF AN ANALOG COLOR TELEVISION SIGNAL

Terrance Smith, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 10, 1987, Ser. No. 37,298
Int. Cl.[4] H04N *9/475*
U.S. Cl. 358—19 **33 Claims**

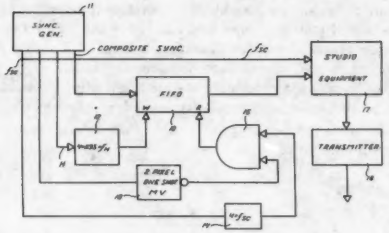


1. A method for removing sampling clock phase error relative to color burst when sampling an analog color television signal, comprising:
obtaining digital samples of the color burst at similar phase locations along a horizontal line of the analog color television signal via the sampling clock;
averaging a plurality of the digital burst samples taken at first similar phase locations of said color burst to form a first averaged sampling phase signal;
averaging a plurality of the digital burst samples taken at second similar phase locations of said color burst to form a second averaged sampling phase signal;
determining the difference between the first and second averaged sampling phase signals to provide a phase error signal indicative of the difference; and
adjusting the phase of the sampling clock in response to the phase error signal.

4,797,731
METHOD AND APPARATUS FOR COMPATIBLY LOCKING HORIZONTAL SYNC TO THE PAL SUBCARRIER

Lee R. Dischert, Burlington, N.J., and Robert J. Topper, Hatboro, Pa., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 9, 1987, Ser. No. 60,097
Int. Cl.[4] H04N 9/44, 11/16
U.S. Cl. 358—17 **5 Claims**



1. Apparatus for generating compatible synchronizing signals for use in a PAL color television system comprising:

a sync generator for providing standard synchronizing signals of a PAL system including waves of the subcarrier frequency, vertical synchronizing signals and line synchronizing signals,

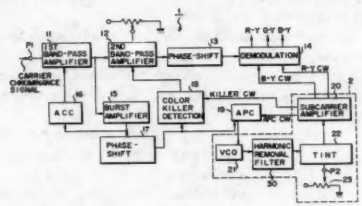
means responsive to signals provided by said sync generator for producing other line synchronizing signals having a frequency such that an integral number of quarter cycles of the subcarrier wave occur between them, there being an additional two quarter cycles between two line synchronizing signals occurring during a vertical blanking interval, and

means coupled to said sync generator and to said means for producing said other line synchronizing signals for combining at least said vertical synchronizing signals and said other line synchronizing signals.

4,797,732
SUBCARRIER GENERATING DEVICE FOR COLOR SIGNAL PROCESSING CIRCUIT

Tokio Aketagawa, Kumagaya, and Osamu Shimano, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1987, Ser. No. 29,769
Claims priority, application Japan, Mar. 26, 1986, 51-65844
Int. Cl.[4] H04N 9/64, 9/68
U.S. Cl. 358—28 **12 Claims**



1. A subcarrier generating device for a color signal processing circuit, comprising:

input means for receiving a burst signal, said burst signal being a part of a color video signal;

oscillating circuit means, for generating a continuous reference subcarrier signal;

harmonic filter means, connected to said oscillating circuit means, for removing harmonic components contained in said continuous reference subcarrier signal and for outputting a filtered continuous reference subcarrier signal;

tint control signal supply circuit means for supplying a tint control signal;

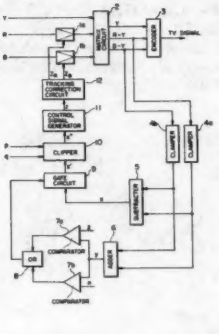
subcarrier signal generating circuit means connected to said harmonic removal filter means and said control voltage supply circuit means, for generating a plurality of reference carrier signals by performing a predetermined processing on said filtered continuous reference subcarrier signal, accoridng to said tint control signal, the phases of said reference carrier signals being related to one another in a predetermined manner; and

phase control means for receiving said burst signal from said input means and one of said reference carrier signals from said subcarrier signal generating circuit means, detecting a phase difference between said burst signal and said reference carrier signal, and controlling the frequency and phase of said continuous reference subcarrier signal generated by said oscillating circuit means such that said burst signal and said reference carrier signal always have a specific phase relationship to one another.

4,797,733
WHITE BALANCE ADJUSTING DEVICE FOR A COLOR VIDEO CAMERA

Yasushi Takagi, and Toshio Murakami, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 129,978
Claims priority, application Japan, Dec. 12, 1986, 61-294808
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—29 **10 Claims**



1. A white balance adjusting device for a color video camera, comprising:

a first detecting means for detecting color temperature variation on the basis of a video signal provided by the color video camera;

a chrominance signal gain control means which is controlled for controlling the gain of chrominance signals by a detection signal provided by the first detecting means;

a second detecting means for detecting color information from the video signal;

a first output means which decides whether the level of the detection signal provided by the second detecting means is within a first range, and provides a first control signal; and

a control execution means which enables the control of the chrominance signal gain control means by the detection signal provided in accordance with the first detecting means by the first control signal, when the level of the

detection signal provided by the second detecting means is in the first range.

4,797,734

PICKUP APPARATUS

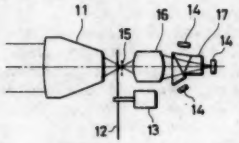
Shigeru Ohshima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 692,629, Jan. 18, 1985, abandoned. This application Apr. 21, 1987, Ser. No. 41,664

Claims priority, application Japan, Jan. 31, 1984, 59-16366

Int. Cl.[4] H04N *9/097*

U.S. Cl. 358—55 **9 Claims**



1. An adapter to be attached between a first imaging system for forming an image of an object at a predetermined position and a camera body having video means for picking up the image of the object comprising:

a second imaging system for re-imaging an image of the object formed at said predetermined position on said video means; and

a shutter disposed at a position proximate to said predetermined position for repeatedly and periodically effecting intermittent exposures.

4,797,735

DISTORTION SURVEILLANCE APPARATUS FOR TELEVISION SIGNAL TRANSMISSION SYSTEM

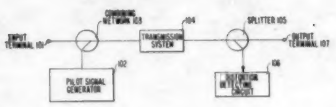
Hitoshi Takai, Hirakata, and Noriaki Morotomi, Fujisawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

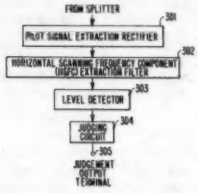
Filed Jul. 2, 1986, Ser. No. 881,832

Claims priority, application Japan, Jul. 4, 1985, 60-147538; Jul. 4, 1985, 60-147551; Jul. 4, 1985, 60-147552

Int. Cl.[4] H04N *7/10*

U.S. Cl. 358—86 **21 Claims**





1. A distortion surveillance apparatus used in a transmission system for signals including a television signal, comprising:

means coupled to a first specified position in said transmission system for supplying a pilot signal to said transmission system;

first extraction means coupled to a second specified position in said transmission system for extracting said pilot signal which has been subjected to a cross modulation with said television signal via a nonlinearity of said transmission system between said first and second specified positions;

rectifying means for obtaining an envelope of said cross modulated pilot signal from an output signal of said first extraction means;

second extraction means for extracting from said envelope at least a signal component of a horizontal scanning frequency of television signal and its harmonic components;

level detection means for detecting a level of a signal extracted by said second extraction means; and

judging means for producing a signal indicating an occurrence of abnormal signal distortion increase when said level detected by said level detection means becomes abnormally large.

4,797,736

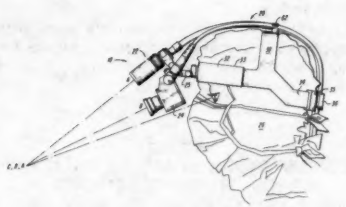
HEAD MOUNTED ILLUMINATION AND CAMERA ASSEMBLY

Jacobus Kloots, Sturbridge, and Frans G. Van Der Bel, Southbridge, both of Mass., assignors to Luxtec Corporation, Sturbridge, Mass.

Filed Sep. 2, 1987, Ser. No. 92,233

Int. Cl.[4] A61B *1/04, 1/06;* **F21V** *13/04;* **H04N** *7/18*

U.S. Cl. 358—93 **20 Claims**



1. A head mounted apparatus for illumination and remote viewing of a work site, said apparatus comprising:

a head band adapted to fit snugly on a human head above the eyes;

camera means mounted on said head band for generating signals representative of the visual image received from the work site;

means mounted on said head band for illuminating the work site; and

means for coupling both said camera means and said illuminating means to said head band, said copling means comprising:

a first pivot to which said camera means is pivotally secured to permit pivoting of said camera means with respect to said illuminating means and said head band;

a second pivot to which said illuminating means is pivotally secured to permit pivoting of said illuminating means with respect to said camera means and said head band; and

a third pivot connecting said coupling means to said head band for pivoting of said illuminating means and said camera means together with respect to said head band.

4,797,737

IMAGING APPARATUS FOR ENDOSCOPE

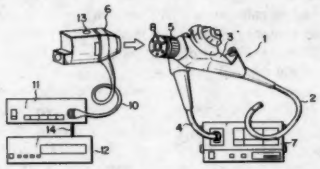
Nobuyoshi Yazawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 117,800

Claims priority, application Japan, Nov. 19, 1986, 61-276086

Int. Cl.[4] A61B 1/04, 1/06; H04N 7/18; G11B 15/18

U.S. Cl. 358—98 6 Claims



1. An imaging apparatus for an endoscope, comprising:

a TV camera which can be mounted on an eyepiece section of the endoscope;

a VTR electrically connected to said TV camera;

a manual switch, arranged in said TV camera, for controlling a recording operation performed by said VTR; and

safety means for automatically stopping the recording operation being performed by said VTR when said camera is removed from the endoscope.

4,797,738

COLOR RECOGNITION APPARATUS

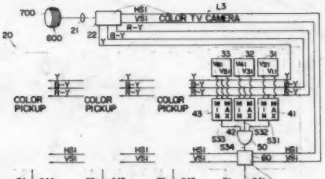
Motofumi Kashi, Chofu, and Hiroaki Shimoe, Hino, both of Japan, assignors to Kabushiki Kaisha Tohken, Tokyo, Japan

Filed May 15, 1987, Ser. No. 50,038

Claims priority, application Japan, May 19, 1986, 61-114244; May 19, 1986, 61-114245; Feb. 14, 1987, 62-32167

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—101 11 Claims



1. A color recognition apparatus wherein the picture of an assigned color is picked up from NTSC system composite color video signals photographed by a color pick-up apparatus, thereby determining color wherein signal components of brightness, chroma and hue are separated from said composite color video signal, and a decision output means is provided to determine whether or not said signal components of brightness, chroma and hue fall within respective ranges of preset upper and lower limit values, wherein a binary signal is outputted if all of said signal components of brightness, chroma and hue are in their respective set ranges; and wherein horizontal and vertical synchronizing signals are separated from said composite color video signal, an area decision means being provided to determine whether or not said synchronizing signals fall within ranges of present upper and lower limit values, a binary signal being outputted if said synchronizing signals fall within their respective set ranges.

4,797,739

METHOD OF COMPRESSING AND RECONSTRUCTING IMAGE SIGNALS BY VECTOR QUANTIZATION

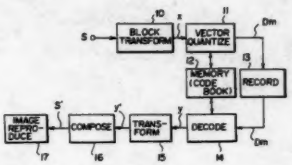
Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1988, Ser. No. 160,372

Claims priority, application Japan, Feb. 25, 1987, 62-42111; Feb. 24, 1988, 63-41713

Int. Cl.[4] H04N 7/133

U.S. Cl. 358—133 3 Claims



1. A method of compressing and reconstructing image signals by vector quantization, which comprises the steps of:

(i) dividing two-dimensional image signals into blocks, each comprising a fixed number of samples,

(ii) selecting a vector that corresponds with the minimum distortion to the set of the image signals in each of the blocks from a code book comprising a plurality of vectors different from one another and prepared in advance by defining said fixed number of vector elements,

(iii) encoding the information representing the selected vector to correspond to each of the blocks, and

(iv) taking the vector elements of the vector, which the encoded information represents, as reconstructed signals of each of the blocks,

wherein the improvement comprises the steps of, in the case where said reconstructed signal attains a value between image signals "a" and "b" subjected to image reproduction and having a relationship of $b-a=\alpha$ where α denotes the minimum level difference corresponding to a density resolution of an image reproducing apparatus:

(a) transforming said reconstructed signal to said image signal "a" or said image signal "b" by giving a larger probability weight to said image signal "a" or said image signal "b", whichever is closer to said reconstructed signal.

4,797,740

REAL-TIME VIDEO SIGNAL PROCESSING DEVICE CAPABLE OF TYPICALLY EXECUTING INTERFRAME CODING

Hidenobu Harasaki; Ichiro Tamitani, and Yukio Endo, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 9, 1987, Ser. No. 59,844

Claims priority, application Japan, Jun. 10, 1986, 61-135316; Aug. 14, 1986, 61-189525; Apr. 30, 1987, 62-108261

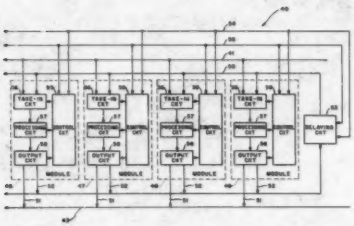
Int. Cl.[4] H04N 7/12

U.S. Cl. 358—136 5 Claims

1. A real-time video signal processing device comprising a real-time video signal processor for processing an input digital video signal having a frame period into an output digital video signal with said input digital video signal divided into a succession of principal blocks, each principal block being in a form of at least one scanning line of said input digital video signal and having a time duration which is shorter than said frame period, each principal block being divisible into at least two partial blocks with each scanning line divided into the respective

partial blocks, said real-time video signal processor comprising:

a plurality of signal processing modules corresponding to the respective partial blocks of each principal block, said signal processing modules being respective to said input digital video signal and an additional digital video signal for processing the respective partial blocks of each principal block into processed signals during said time duration, respectively, each processed signal comprising a first and



a second partial signal, the first partial signals produced in response to said input and said additional digital video signals being used as said output digital video signal; and

delaying means coupled to said signal processing modules for delaying the second partial signals produced in response to said input and said additional digital video signals into a delayed signal with a delay which is equal to a difference between said frame period and said time duration, said delayed signal being supplied back to said signal processing modules as said additional digital video signal.

4,797,741

INFORMATION SIGNAL TRANSMISSION SYSTEM

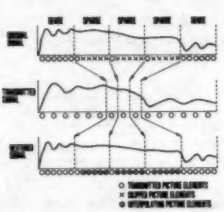
Chikara Sato; Tadayoshi Nakayama; Koji Takahashi, and Tomohiko Sasatani, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,936

Claims priority, application Japan, Aug. 28, 1985, 60-189275; Dec. 23, 1985, 60-291175

Int. Cl.[4] H04N 7/12

U.S. Cl. 358—138 **35 Claims**



1. An information signal transmission system for transmitting an original image signal corresponding to an original picture consisting of m picture elements (m is an integer, $m \geq 2$) by dividing the original picture into a plurality of picture element blocks, each consisting of n adjoining picture elements (n is an integer, $n < m$), sampling image signals corresponding to the respective picture element blocks on the basis of one of a plurality of sampling modes which are different from each other in number of picture elements to be sampled and then transmitting the image signals, comprising:

(A) first image information signal sampling means for sampling a first image information signal corresponding to a first picture element among the n picture elements constituting each picture element block, in respect of all of said plurality of picture element blocks;

(B) first memory means for storing the first image information signals of each picture element block sampled by said first image information signal sampling means;

(C) second image information signal sampling means for sampling a second image information signal corresponding to a second picture element, which is different from said first picture element, among the n picture elements constituting each picture element block, in respect of at least a part of said plurality of picture elements;

(D) second memory means for storing the second image information signals sampled by said second image information signal sampling means;

(E) sampling mode indicating signal generating means arranged to decode which sampling mode among said plurality of sampling mode is adopted, in respect of the respect blocks of said plurality of picture element blocks, and to output a sampling mode thus decided; and

(F) transmission signal forming means arranged to read out the image information signals from said first memory means or said second memory means by sequentially reading out the image information signals corresponding to the picture elements arranged in a same horizontal direction of said original picture, among the first image information signals or the second information signals stored in said first or second memory means, according to the sampling mode indicated by said sampling mode indicating signal and to form a transmission signal by using said first image information signals and said second image information signals.

4,797,742

DIVISIONAL IMAGE TRANSMISSION SYSTEM AND METHOD

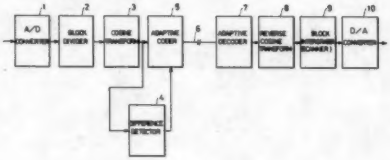
Fumio Sugiyama, Sagamihara, and Kenshi Dachiku, Machida, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 12, 1987, Ser. No. 14,016

Claims priority, application Japan, Mar. 31, 1986, 61-072973

Int. Cl.[4] H04N 7/04

U.S. Cl. 358—141 **15 Claims**



1. An image transmission system comprising:

(*a*) dividing means for dividing an image frame into a plurality of blocks;

(*b*) transforming means responsive to said dividing means, for transforming video information signals block by block to generate transform coefficients in accordance with an orthogonal transform method;

(*c*) detecting means responsive to said transforming means, for detecting differences in transform coefficient between a current frame and a past frame for each block and outputting a difference presence signal when a sum of the detected differences in transform coefficient in each block exceeds a predetermined threshold; and

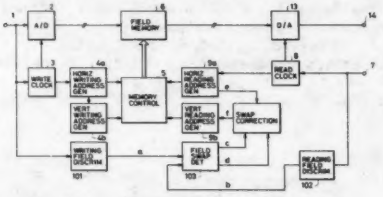
(d) coding means responsive to said transforming means and said detecting means, for coding and transmitting the transform coefficients block by block in response to the difference presence signal outputted from said detecting means.

4,797,743

VIDEO MEMORY CONTROL DEVICE

Haruhito Miyazaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 22,899
Claims priority, application Japan, Mar. 6, 1986, 61-49253
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 8 Claims



1. A video memory control device for the synchronous conversion of video signals transmitted in a first field and a second field, each field comprising a plurality of lines, each line having a period of substantially 1H in duration, said lines intended for display in a correct sequence of a line of said first field being followed by a line of said second field, said system comprising:

a digital memory having a capacity corresponding to one of said fields;

writing means for writing received video signals into said memory according to a writing address;

reading means for reading data from said memory according to a reading address;

sequential addressing means for sequentially providing both said writing address and said reading address;

address processing means for altering an operation of said sequential addressing means, said address processing means comprising:

first means for advancing said reading address by a period of substantially 1H in duration; and

second means for delaying said reading address by a period of substantially 1H in duration; and

means for selectively enabling one of said first and second means according to a phase relation between first data indicating whether said writing address is for said first field or said second field, and second data indicating whether said reading address is for said first field or said second field, whereby said reading address is generated in a corrected sequence, allowing lines to be displayed in said correct sequence.

4,797,744

METHOD AND CIRCUIT FOR NONLINEAR TRANSMISSION-PROCESSING OF A VIDEO SIGNAL

Wolfram Klemmer, Langen, and Reinhard Kirschenstein, Rossdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

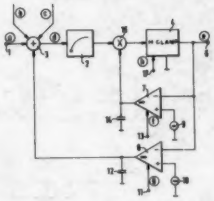
Filed Jun. 10, 1987, Ser. No. 61,121
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3620990
Int. Cl.[4] H04N 5/20, 5/16
U.S. Cl. 358—164 12 Claims

1. Method of nonlinear transmission-processing of a video signal having horizontal and vertical video blanking intervals, with correction of tendencies for variation of signal offset and amplification with respect to a nonlinear characteristic of a transmission-processing stage, comprising the steps of:

inserting first and second series of control pulses in blanking intervals of said video signal prior to processing said video signal in said transmission-processing stage;

processing said video signal and said inserted pulses in said nonlinear processing stage;

comparing pulses of said first and second pulse series, as obtained from a signal derived from the output of said nonlinear transmission-processing stage, respectively with first and second reference signal values to produce first and second correction signals;



applying said first correction signal as a correction of said video signal prior to processing said video signal in said transmission-processing stage, and

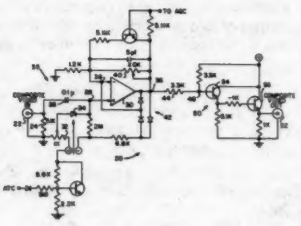
applying said second correction signal as a correction of said video signal following its processing by said transmission-processing stage.

4,797,745

VIDEO IMAGE ENHANCER

William E. Westell, Weston, Mass., assignor to Baird Corporation, Bedford, Mass.

Filed Feb. 11, 1985, Ser. No. 700,620
Int. Cl.[4] H04N 5/57, 5/14, 5/202
U.S. Cl. 358—169 7 Claims



1. A video image enhancer comprising:

(a) an input designed to receive a composite video signal having high and low contrast segments and dark and bright segments;

(b) a device coupled to said input and designed to selectively amplify said low contrast segments and said dark segments of said composite video signal, and to selectively diminish said high contrast segments and said bright segments, said device being a non-inverting operational amplifier having a non-inverting input and an output;

(c) a first variable potentiometer and a dc restorer circuit connected to said non-inverting input of said device to provide an adjustable-bias dc clamp of said composite video signal;

(d) a second variable potentiometer connected between a negative input and said output of said device for adjusting the gain of said device at said output;

(e) a driver coupled to said output of said device to provide a low impedance output video signal with said low contrast and dark segments enhanced and with said high contrast and bright segments diminished; and

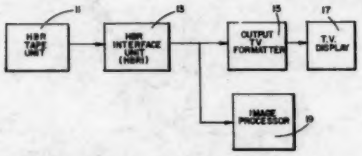
(f) a signal shaping network in the form of a diode clamp connected to said output of said device.

4,797,746

DIGITAL IMAGE INTERFACE SYSTEM

William D. Ashcraft, Fullerton, Calif., assignor to Rockwell International Coporation, El Segundo, Calif.

Filed Aug. 24, 1987, Ser. No. 88,369
Int. Cl.[4] H04N *7/01, 17/00*
U.S. Cl. 358—140 6 Claims



1. An interface system for converting digital image information into an output format, the interface system comprising:

an input for receiving input digital image information;

a memory connected to said input for storing said digital image information;

an input controller connected to said memory and comprising a programmable logic array programmed according to a plurality of formats, each, format corresponding to a format of a respective input digital image information signal, to cause said input digital image information to be read into said memory in a predetermined memory format;

means for selecting a format in said programmable logic array a format corresponding to the format of the format of the received input digital image information signal;

an output connected to said memory for outputting said digital image information;

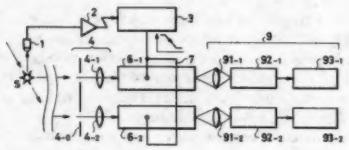
an output controller connected to said memory for controlling the output of said memory to cause said digital image information to be readout of said memory in said output format.

4,797,747

STREAK CAMERA DEVICE HAVING A PLURALITY OF STREAK TUBES

Yoshihiro Takiguchi, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 3, 1987, Ser. No. 21,228
Claims priority, application Japan, Mar. 4, 1986, 61-46579
Int. Cl.[4] H04N *3/18*
U.S. Cl. 358—217 11 Claims



1. A streak camera device, comprising:

plural streak tube means generating a plurality of tube outputs for simultaneous measurement of a plurality of separate characteristics of a light emission, the plural streak tube means forming electron beams in response to the light emission;

deflecting signal generating means including only a single deflecting signal generating device generating a deflection output for simultaneously deflecting the corresponding respective beams of the plural streak tube means; and

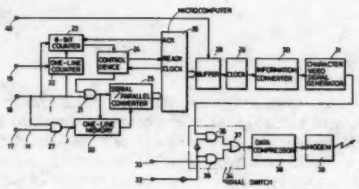
means for recording the tube outputs of the streak tube means.

4,797,748

APPARATUS FOR SETTING TIME INFORMATION IN FACSIMILE SYSTEM

Matahira Kotani, Nara; Motohiko Hayashi, Yamatokoriyama, and Yoshikatsu Ooi, Habikino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1986, Ser. No. 921,148
Claims priority, application Japan, Oct. 21, 1985, 60-235948
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 6 Claims



1. Apparatus for reading time information into an internal clock of a facsimile system, comprising:

means for sampling time mark data on a time mark sheet fed into an image reader of said facsimile system;

means for converting said sampled time mark data into said time information; and

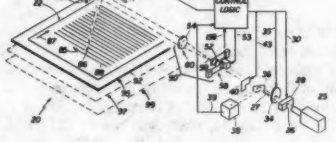
means for setting said internal clock of said facsimile system with the time information produced by said means for converting.

4,797,749

SCANNING SYSTEM WITH TUNABLE RESONANT ACTUATOR

Dean R. Paulsen, Danvers, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Nov. 18, 1986, Ser. No. 932,687
Int. Cl.[4] H04N *1/21*
U.S. Cl. 358—302 8 Claims



1. In a surface-scanning system defining an optical path and having a scanning assembly comprised of X and Y angularly oscillating scanners for deflecting a portion of said path, and first and second optical elements aligned with stationary portions of said optical path and driven in rectilinear oscillating motions along said path to provide focus correction respectively for said X and Y scanners,

the improvement wherein

said X direction scanner is of the resonant type and provided with means for dynamically tuning its resonant frequency,

said first optical element is mounted to oscillate in rectilinear resonant motion, and

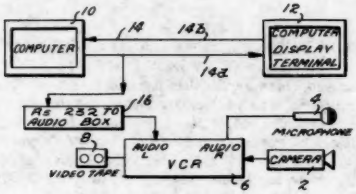
said tuning means of said X direction scanner is arranged to receive a signal representing the oscillations of said first optical element and to tune the resonant frequency of said X direction scanner to synchronize its resonant motion with that of said first optical element.

4,797,750

METHOD AND APPARATUS FOR TRANSMITTING/RECORDING COMPUTER-GENERATED DISPLAYS ON AN INFORMATION CHANNEL HAVING ONLY AUDIO BANDWIDTH

Michael J. Karweit, Baltimore, Md., assignor to John Hopkins University, Baltimore, Md.

Filed Apr. 16, 1986, Ser. No. 852,738
Int. Cl.[4] H04N 5/782
U.S. Cl. 358—335 43 Claims



1. Apparatus for transmitting a computer-generated image together with an audio signal, comprising:

audio signal generating means adapted for receiving an aural input and converting said aural input into electrical audio signals indicative thereof;

computer means for generating first display codes from which said computer-generated image may be derived;

first conversion means for receiving said first display codes and converting each said display code into an electrical audio tone signals indicative of said each first display codes; and

transmission means, coupled to said audio signal generating means and to said first conversion means and having first and second channels of an audio bandwidth, for simultaneously transmitting said audio signals on said first channel and said audio tone signals on said second channel.

41. An apparatus for recording an informational session in synchronism with images on a computer display, comprising:

means for receiving said informational session, and for encoding said informational session into a form which can be recorded on a recording medium;

a computer for performing processing operations of a type related to said information session and for creating first display codes indicative of characters to be displayed on the screen of said computer;

a modem, coupled to said computer to receive said first display codes to produce audio signals indicative of said first display codes; and

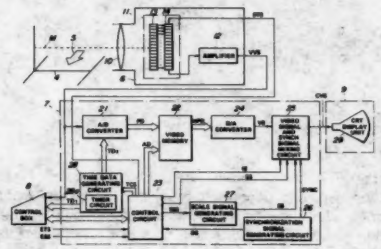
multi-channel recording means, coupled to simultaneously receive said encoded informational session information on one channel thereof and said encoded display codes on another channel thereof, for recording said information on respective channels on the recording medium.

4,797,751

ELECTRONIC CAMERA APPARATUS FOR RECORDING AND REPRODUCING MOVING OBJECT IMAGES

Yoshihisa Yamaguchi, Tokyo, Japan, assignor to Yamaguchi Cinema Corporation, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,550
Claims priority, application Japan, Jun. 19, 1985, 60-133355; Jun. 19, 1985, 60-133356; Jun. 19, 1985, 60-133357; Jun. 19, 1985, 60-133358
Int. Cl.[4] H04N 5/91
U.S. Cl. 358--335 9 Claims



1. A video recording and reproducing apparatus comprising:

a. a line sensor camera having a line scan image sensor which is scanned along a predetermined standard line and receives an image of a plurality of moving objects passing the standard line and having an image pick-up section having means for picking up the image of at least two moving objects, said sensor having a scan speed set in response to an estimated speed of said objects;

b. first converter means for successively converting a one vertical scanning line output video signal of the line sensor camera into picture element data;

c. storage means for successively storing the picture element data, for a plurality of pictures, supplied from the first converter means;

d. selection means for selecting a desired picture from the plurality of the pictures;

e. read means for successively reading the picture element data corresponding to the selected picture by the selection means from the picture element data for the plurality of the pictures written on the storage means;

f. second converter means for converting the picture element data read by the read means into a video signal; and

g. display means for displaying a continuous picture image of said at least two moving objects moving in accordance with time on said one vertical scanning line video signal supplied to said display means from the second converter means.

4,797,752

INFORMATION STORAGE CARRIER AND METHOD FOR STORING DUPLICATE INFORMATION

Gary M. Giddings, Laguna Hills, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 327,321, Dec. 4, 1981. This application Feb. 13, 1984, Ser. No. 579,618
Int. Cl.[4] H04N 5/85; G11B 7/007
U.S. Cl. 358—342 4 Claims

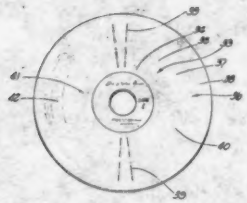
4. A method for storing intelligence information along a path on an information storage carrier, said method comprising the steps of:

providing an information storage member having a surface upon which said information is to be recorded;

recording a first series of lineal regions on said surface, defining a program of information, said program having a first subprogram part and a second subprogram part, said second subprogram part having a series of information

segments identified by a corresponding first series of identification numbers; and

recording a second series of lenial regions arranged on said surface and spaced from said first series of lineal regions, each lineal region of said second series of regions containing information segments duplicative of respective information segments of said second subprogram part of said



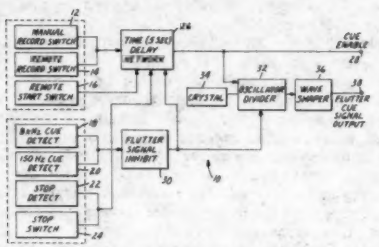
first series of lineal regions, said duplicative series of information segments identified by a corresponding second series of identification numbers, said first series of identification numbers being different than said second series of identifications numbers, thereby providing duplication of said second subprogram part of said program of information at two locations on said storage member.

4,797,753

MONITOR FOR VISUALLY INDICATING WEAR ON RECORD MEDIA

Joseph D. Montgomery, Bloomington, Ill., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 10, 1986, Ser. No. 917,490
Int. Cl.[4] G11B 5/00, 27/36; G01N 27/72
U.S. Cl. 360—27 **10 Claims**



1. A device for dynamically indicating relative wear in a cartridge containing recorded magnetic tape based on the amount of flutter present in signals reproduced from the tape, wherein message containing signals are recorded within at least a first track on said tape and a plurality of first cue signals are recorded on a second track on said tape at predetermined locations relative to the locations on said first track to define predetermined portions of the message containing signals, said device comprising:

(a) encode means including

(i) means for providing flutter detect cue signals containing uniquely identifiable components distinguishable upon playback from said first cue signals and

(ii) means responsive to said first cut signals for enabling recording said flutter detect cue signal onto said second track at locations outside of said predetermined locations and at least nominally coextensive with said locations at which said message containing signals are recorded on said first track, and

(b) decode means responsive to cue signals reproduced from said second track concurrently with said message containing signals reproduced from said first track, including

(i) means responsive to said unique signal components of said reproduced cue signals for producing a playback flutter detect cue signal,

(ii) means for comparing said playback flutter detect cue signal with a reference signal containing said uniquely identifiable components to produce an error signal indicative of the relative magnitude of flutter in said playback signal on said second track,

(iii) means responsive to said error signal for producing parallel outputs, each successive output being activated upon the occurrence of an error signal the level of which exceeds a previous level by a given amount, and

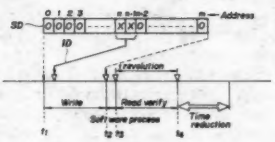
(iv) display means coupled to each of said plurality of successive outputs for producing a different visual indication upon the activation of a given successive output, whereby the relative magnitude of flutter in said playback signal and hence the amount of wear is readily determinable by the visual indication thus produced.

4,797,754

METHOD FOR WRITING SERVO PATTERN IN MAGNETIC DISK UNIT

Mitaga Sugano, Odawara; Shinichi Kaneko, Hadano; Mitsunori Oka, Fujisawa; Kimiya Nokina, Naka, and Kazuhiro Koshimizu, Hiratsuka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Eng. Co., Ltd., both of Tokyo, Japan

Filed Dec. 15, 1986, Ser. No. 941,645
Claims priority, application Japan, Dec. 13, 1985, 60-279179
Int. Cl.[4] G11B 5/09, 15/12
U.S. Cl. 360—48 **5 Claims**



1. A method of writing servo pattern data on a rotating magnetic disk having a plurality of recording tracks, comprising the steps of:

(a) writing servo pattern data including an index pattern onto a selected recording track of said rotating magnetic disk;

(b) effecting a plurality of processes during a predetermined period of time of known length immediately following said writing of servo pattern data;

(c) reading the servo pattern data which has been written on said selected recording track, including reading the index pattern included in said servo pattern data immediately following completion of said plurality of processes; and

(d) comparing the servo pattern data read from said selected recording track with the servo pattern data written on said selected recording track to determine whether a coincidence exists therebetween;

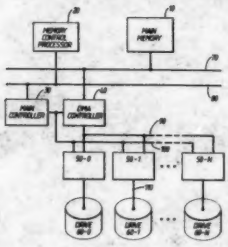
wherein said index pattern is positioned within said servo pattern data at a location which is spaced from the beginning of the servo pattern data by a distance which results in said index pattern being read out in step (c) without delay following completion of said plurality of processes.

4,797,755

SYSTEM AND METHOD FOR TRANSFERRING DATA BETWEEN A PLURALITY OF DISKS AND A MEMORY

David R. Baldwin, Sheppston, United Kingdom, and Shingo Sata, Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Oct. 2, 1986, Ser. No. 914,671
Claims priority, application Japan, Oct. 2, 1985, 60-217968
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—49 10 Claims



1. A system for data transfer comprising:
a memory;
a data bus coupled to said memory;
a plurality of disks each having surfaces divided into sectors in which data may be stored;
drive means for rotating said disks;
a plurality of data transfer heads, one said transfer head associated with each disk surface;
sector determining means for determining the current sector of each disk surface relative to the associated head;
a buffer coupled between each of said heads and said data bus; and
control means responsive to said sector determining means for transferring data between said head and said associated disk surface whenever said head for that surface is at the beginning of any sector involved in said transfer,
said control means further includes means for determining a correspondence between a location in said memory and a sector of said disk surfaces for data involved in said transfer and for individually transferring data directly with said memory and between said head and said associated disk surface for each sector involved in said transfer in an order independent of the order of said data in said memory.

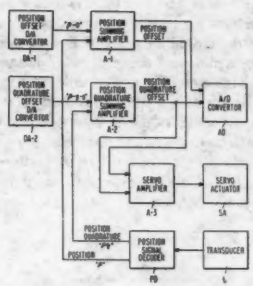
4,797,756

METHOD FOR POSITIONING HEAD IN DISK DRIVE DERIVING "POSITION" OFFSET FROM "QUADRATURE" SIGNALS

Hideki Yoshihara, San Jose, and Nicholas M. Warner, Livermore, both of Calif., assignors to Unisys Corp., Detroit, Mich.

Filed Mar. 5, 1987, Ser. No. 22,189
Int. Cl.[4] G11B 20/00
U.S. Cl. 360—77.02 10 Claims

1. A method of automatically effecting absolute track registration of a R/W actuator means in a disk file of a disk drive servo system including a servo transducer, and associated servo control means including means for generating positioning signals PS comprising position signals P and related position-quadrature signals Q, this method including the steps of:
registering the actuator means in a nominal initial rest position corresponding to a zero-crossing of one of the signals PS and causing an initial sample-offset thereof;
detecting the corresponding magnitude of another of the positioning signals PS, repeatedly, until arriving at the peak-value/location thereof, and using the position-offset corresponding to this peak-location to derive a tru-offset value T-O and repositioning actuator means by this value T-0; and



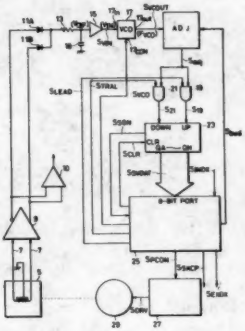
repeating the foregoing for a prescribed number of track sites across the disk file.

4,797,757

SERVO HEAD POSITIONER WITH PULSE ADJUSTING CIRCUITRY

Munehisa Haitani, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 25, 1986, Ser. No. 899,812
Claims priority, application Japan, Aug. 23, 1985, 60-128571[U]
Int. Cl.[4] G11B 5/596
U.S. Cl. 360—77.08 3 Claims



1. A servo control apparatus for positioning a head at a target track position on a disk, comprising:
a position data region extending radially of the disk having recorded therein servo information for indicating deviation of the head from any selected one of a plurality of track positions of the disk;
indexing means for providing an index signal marking said position data region on the disk;
reading means including the head for reading the servo information stored in the position data region for a target track on which the head is to be precisely positioned;
signal providing means for providing a pulse signal representing the servo information which is read by the head in the position data region of the disk;
control means responsive to said index signal from said indexing means for generating a basic window signal representing a predetermined pulse signal supply time

period in which deviationindicating pulses occurring in said pulse signal are to be supplied as an output;

adjusting means receiving said pulse signal from said signal providing means and said basic window signal from said control means for providing an adjusted output signal of only the deviationindicating pulses of said pulse signal occurring within said predetermined time period;

counting means including a reversible counter for maintaining a pulse count based upon said adjusted output signal which is indicative of the deviation of the head from the target track position of the disk; and

driving means for driving said head to the precise target track position in accordance with the counted output of said reversible counter.

4,797,758

PINCH ROLLER DRIVING MECHANISM

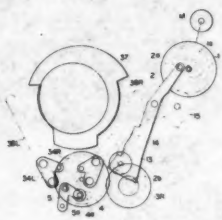
Katsumi Yamaguchi; Syouichiro Yokoi; Takao Kanai, and Kikuo Yoshikawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1987, Ser. No. 713

Claims priority, application Japan, Jan. 14, 1986, 61-6052; Jan. 14, 1986, 61-6051; Jan. 14, 1986, 61-3223[U]; Jan. 29, 1986, 61-10382[U]

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—85 **8 Claims**



1. A mechanism for a tape recorder provided with a rotating head, comprising:

a driving gear driven by a selectively operable tape loading motor;

first and second tape loading gears and means responsvive to movement of said loading gears for moving a pair of tape loading blocks to positions in which a tape guided by said loading blocks extends at least partway around said rotating head;

first driving force transmitting means for transmitting a driving force from said driving gear to said first tape loading gear;

second driving force transmitting means for transmitting said driving force from said first tape loading gear to said second tape loading gear, said second driving force transmitting means including a rotatable cam gear having thereon a cam; and

pinch roller driving means engaging said cam of said cam gear for moving a pinch roller toward a capstan in response to rotation of said cam gear, said pinch roller driving means including a pinch roller gear, and said cam on said cam gear causing said pinch roller driving means to initiate movement of said pinch roller at a point in time after said loading blocks have been moved a predetermined distance.

4,797,759

TAPE RECORDER MODE SELECTOR DEVICE FOR PLURAL CASSETTE TAPES

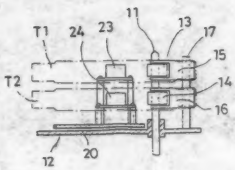
Satoru Koizumi; Daisuke Teshima, and Yoshio Katayama, all of HigashiHiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 24, 1986, Ser. No. 911,150

Claims priority, application Japan, Sep. 26, 1985, 60-213520

Int. Cl.[4] G11B *15/68*

U.S. Cl. 360—92 **3 Claims**



1. A tape recorder comprising:

a cassette tape compartment for detachably housing a plurality of cassette tapes,

a capstan on which said plurality of cassette tapes housed in said tape compartment are coaxially loaded,

a separate roller means for driving each of said plurality of cassette tapes, each of said roller means being mounted so that it can be pressed against said capstan,

a single control means for selecting a cassette tape to be driven by said roller means,

means for selecting one of a plurality of cassette tape drive modes, said mode selecting means comprising a record button, a play button, a fast forward button, a rewind button and a stop button, each of said buttons actuating a drive mode for any selected cassette tape,

said single control means including a tape selecting member,

said tape selecting member including means for placing the roller means for driving any non-selected tape in a non-driving position spaced from said capstan, and

fast rotator means alternatively positionable for causing the selected cassette to rotate at a high speed for a rewinding operation or for a fast-forwarding operation.

4,797,760

CASSETTE DECK WITH COMBINATION TAPE PULL-OUT & TENSIONING LEVERS

Karl-Heinz Rademacher, Alsbach, and Theo Wolf, Rossdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,820

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626940

Int. Cl.[4] G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—95 **6 Claims**

1. Magnetic tape transducing apparatus with automatic tape withdrawal, to withdraw tape (**11**) from a cassette (**12**), having support means (**65*a***) for supporting the cassette (**12**);

dynamo electric means (**M1,M2**) for, respectively, driving a cassette reel (**R1,R2**) for supplying tape and taking up tape, and providing tensioning torque, to maintain tape tensioned at a predetermined level;

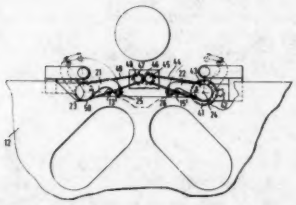
tape tension control means (**21, 22; 90,91,91*a***) coupled to the tape and to the dynamo electric means and controlling the dynamo electric means to maintain a predetermined tape tension,

said apparatus comprising, in accordance with the invention,

tape loading elements (**21, 22**) located on the support means and movable from a rest position for engagement behind the tape (**11**) in the cassette and to move the tape out of the cassette towards a transducing path (**11', 11'', 11*a***);

means (60) for moving the tape loading elements from the rest position to move said tape toward the transducing path; and

means (90,91,91*a*) sensing the position of the tape loading elements during operation of the apparatus when said tape loading elements are engaged by the tape,



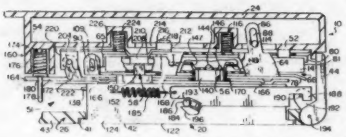
said tape loading elements (21, 22) and said position sensing means (90,91,91*a*) forming part of the tape tension control means, controlling the dynamo electric means during removal of tape from the cassette, placing the tape in the transducing path, and controlling tape tension during tape operation when in said transducing path.

4,797,761

TELESCOPING DISK DRIVE ASSEMBLY

Vincent L. Cocco, Wakefield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 13, 1986, Ser. No. 874,003
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—99.06 **7 Claims**



1. A compact apparatus for writing and/or reading information on a disk, said apparatus comprising:

a housing including a first housing section having a first opening, a telescoping second housing section, and means for mounting said second housing section on said first housing section to move by sliding through said first opening between a compact operative position and an extended disk insertion and withdrawal position;

means for defining a second opening in said first housing section serving as an access opening through which a disk is moved for insertion and withdrawal;

a disk drive within said housing for writing and/or reading information on a disk inserted thereinto through said access opening, said disk drive including at least first and second components mounted, respectively, on said first and second housing sections for relative movement therewith between said compact position, wherein said first and second components are in operative relation with the disk for write and/or read operations, and said extended position wherein at least one of said first and second components is spaced further away from the disk, than when said first and second components are in said operative position, for facilitating disk insertion and withdrawal operations;

means on said first housing section for applying a biasing force on said second housing section urging it toward said extended position;

latching means for releasably latching said second housing section, said latching means being movable between a latching position wherein it retains said second housing section in said compact position against the urging of said applied biasing force, and an unlatching position wherein it releases said second housing section for movement to said extended position under the influence of said biasing force; and

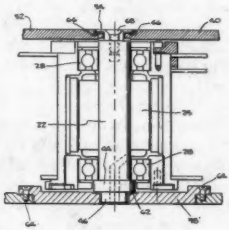
a door mounted on said housing for movement between a closed position blocking said access opening and an open position unblocking said access opening.

4,797,762

STRESS FREE WINCHESTER DRIVE SHAFT MOUNTING

Lloyd Levy, Northridge; Dan L. Kilmer, Reseda, and Kevin P. Maher, Burbank, all of Calif., assignors to Micropolis Corporation, Chatsworth, Calif.

Filed Sep. 22, 1987, Ser. No. 99,536
Int. Cl.[4] G11B *5/105, 17/02, 21/02*
U.S. Cl. 360—99.06 **20 Claims**



1. A Winchester disk drive assembly having stress free shaft mounting arrangements comprising:

a housing for the disk drive including first and second spaced mounting plates;

a disk drive mounted within said housing, said disk drive including shafts for both a main drive motor assembly and for a head positioner;

a first end of at least one of said shafts being rigidly secured to said first mounting plate;

means including a shouldered washer for securing the second end of said shaft to said second mounting plate;

said second mounting plate having a hole and an associated counterbored recess for receiving said shouldered washer;

said washer having a reduced diameter portion for engagement with said second end of said shaft, at a point spaced inward from said second mounting plate, and having an enlarged portion located in said counterbore;

screw means for holding said shouldered washer in firm engagement with said second end of said shaft, and with the enlarged portion of said shouldered washer spaced from said counterbored recess; and

adhesive means for filling the space between the enlarged portion of said shouldered washer and said counterbored recess and for firmly securing said shouldered washer to said second mounting plate following securing of said washer to the end of said shaft;

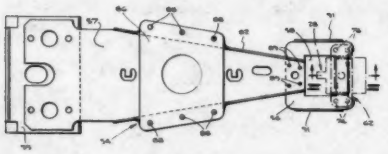
whereby a stress-free mounting of said shaft is obtained, with access being provided to the housing by removing said screw means, and disassembling said second plate with said washer.

4,797,763

COMPACT MAGNETIC HEAD FLEXIBLE SUSPENSION

Lloyd Levy, Chatsworth; Michael W. Warner, Westlake, and Dan L. Kilmer, Reseda, all of Calif., assignors to Micropolis Corporation, Chatsworth, Calif.

Filed Aug. 13, 1986, Ser. No. 896,383
Int. Cl.[4] G11B *5/48, 21/16*
U.S. Cl. 360—104 **18 Claims**



1. A hard disk memory head mounting assembly having low inertia and reduced inter-disk spacing, comprising:

an extended load beam mounting arm having a substantially ring-shaped outer end including a transverse head supporting portion at its outermost end;

a standard hard disk type magnetic head having a first disk bearing and coupling side having a pair of longitudinally extending grooves, and a second mounting side having a transverse mounting slot therethrough;

means for mounting said magnetic head to said transverse head supporting portion, with said portion extending through the mounting slot, and said head having one portion extending up into the opening in the ring-shaped outer end of said mounting arm; and

said mounting means being a springy sheet metal member having a central broad area with a rounded bearing means extending from said broad central area for pivotally engaging substantially the center of said transverse head supporting portion at an engagement point at the end of said rounded bearing means, said central broad area being secured to said magnetic heat at the bottom of said mounting slot, and said sheet metal member having two arms extending from said central broad area in opposite directions along said supporting portion and bonded to said supporting portion at the ends of each said arm;

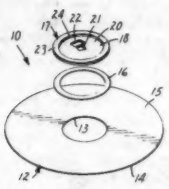
whereby the magnetic head is pivotally and resiliently mounted to said mounting arm to pivot through small angles about the engagement point at the end of said rounded bearing means.

4,797,764

RECORDING DISK WITH LOW TOTAL INDICATED RUNOUT

Arlin B. Doering, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1986, Ser. No. 823,190
Int. Cl.[4] G11B *5/82*
U.S. Cl. 360—135 **4 Claims**



1. A magnetic recording medium disk comprising:

a one-piece hub, including a center portion and a flange portion, said center portion having a planar drive surface and said flange portion having a characteristic total indicated runout (hub T.I.R.);

a magnetic medium, including a side zero and a side one; and

a thermoplastic adhesive which can be melted by ultrasonic vibrations, located between the magnetic medium and the hub flange and bonding said side one of said medium to said flange of said hub;

said side zero of said medium being fixed a distance, α, from the plane of said drive surface, the total indicated runout of α being called α T.I.R.;

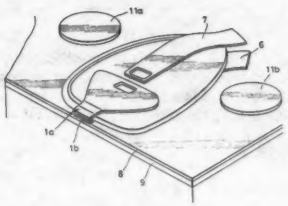
wherein, the T.I.R. ratio is defined as hub T.I.R. divided by α T.I.R., and the magnetic recording medium disk is characterized by a T.I.R. ratio greater than one.

4,797,765

THIN FILM MAGNETIC HEAD HAVING SOLDER-BONDED PROTECTIVE PLATE

Joichiro Ezaki, and Hiroshi Kanai, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 847,358, Apr. 2, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,542
Claims priority, application Japan, Apr. 3, 1985, 60-48668[U]
Int. Cl.[4] G11B *5/255, 5/31, 5/105*
U.S. Cl. 360—110 **5 Claims**



1. A thin film magnetic head comprising:

a head structure having a substrate, a head core formed of a thin magnetic material on said substrate, and a conductor encircling said head core to form a coil,

a protective plate,

at least two isolated first solder areas formed directly on the surface of said substrate,

at least two isolated second solder areas formed on the surface of said protective plate,

the protective plate facing the substrate such that the second solder areas are at a plane-symmetrical or mirror image position with respect to the first solder areas,

the first and second solder areas being vertically registered and fused together,

whereby a bond is formed between the head structure and said protective plate at said isolated solder areas,

the surface of said head structure which faces the protective plate, except for said first solder areas, being covered by a protective coating, said first solder areas being partially encased in said protective coating.

4,797,766

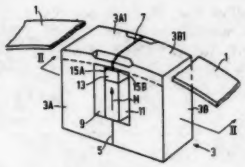
MAGNETIC HEAD WITH MAGNETORESISTIVE ELEMENT

Ulrich E. Enz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1986, Ser. No. 929,940
Claims priority, application Netherlands, Feb. 17, 1986, 8600390
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **12 Claims**

1. A magnetic head, particularly for reading information from a magnetic registration medium, which magnetic head comprises a magnetic yoke having two limbs spaced at a dis-

tance from each other whose free ends constitute pole faces on either side of a read gap present between the limbs and defined thereby, said magnetic head also comprising a magnetoresistive element present within the magnetic yoke at a distance from the pole faces, characterized in that a magnetic intermediate yoke is arranged between the limbs of the magnetic yoke



and in that the magnetoresistive element is formed by a layer of Bi provided on said intermediate yoke, which layer of Bi, viewed in the longitudinal direction of the read gap, extends on either side of said gap and at least during operation is present in a constant magnetic field directed transversely to the layer of Bi.

4,797,767

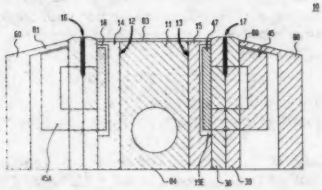
DIGITAL MAGNETIC HEAD STRUCTURE

Rene Baus, Jr., Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed Nov. 20, 1986, Ser. No. 933,075

Int. Cl.[4] G11B *5/265, 5/29, 5/127*

U.S. Cl. 360—121 **9 Claims**



1. A magnetic head assembly comprising first and second wafers of abrasion resistive material, each of said wafers having first and second major faces and anterior and posterior edges, each of said wafers including first and second slots extending inwardly from each of said anterior and posterior edges and extending from said first to said second major faces, like numbered ones of said slots being aligned with one another, respective opposing slots in said first and second wafers also being in alignment, each of said slots including magnetically soft material, said material in said first and second slots at said interior edge extending to said anterior edge and also being abrasion-resistive, each of said faces of said first and second wafers including lateral troughs extending laterally across said slots, a glass layer between said first faces, said first faces being juxtaposed with respect to one another, the anterior edges thereof being separated by said glass layer, first and second flux closure elements abutting opposing second faces and extending between magnetically soft material filling respective ones of said opposing slots for forming flux closure paths therebetween.

4,797,768

MAGNETIC TAPE CASSETTE WITH SPRING BIASED U-SHAPED PIVOTABLE GUARD PANEL

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

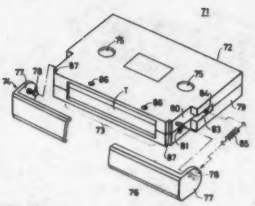
Division of Ser. No. 687,304, Dec. 28, 1984, Pat. No. 4,701,822.

This application May 19, 1987, Ser. No. 51,331

Claims priority, application Japan, Dec. 28, 1983, 58-199198; Dec. 28, 1983, 58-199199; Jan. 4, 1984, 59-1; Jan. 4, 1984, 59-2; Jan. 19, 1984, 59-5613; Jan. 19, 1984, 59-5616

Int. Cl.[4] G11B *23/04*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette having a cassette case including upper and lower halves, a front wall, a rear wall, and laterally opposed right and left side walls, a magnetic head inserting opening formed in the front wall of said cassette case, said cassette case incorporating a pair of hubs on which a magnetic tape is wound, the improvement comprising:

said cassette case having shaft-receiving through-holes in front end portions of right and left side walls thereof, each shaft receiving through-hole being of V-shape inclined forwardly and opening towards the front wall and bisected by a line dividing the casing into said upper and lower halves;

a substantially U-shaped guard panel, said guard panel comprising a front piece and right and left end pieces at opposite ends of said front piece, cylindrical shafts fixedly mounted to respective right and left end pieces on the inside faces thereof, facing each other, and being slidably engaged with respective ones of said shaft-receiving through-holes, each cylindrical shaft having a base part proximate to said end piece and an end part remote from said end piece, which are each in the form of a radial flange having a diameter larger than the diameter of said shaft-receiving through-hole and having an intermediate portion smaller in diameter than said shaft-receiving through-hole and being positioned therein and captured thereby, and said guard panel being swingable vertically of said cassette and adapted to close said opening; and

urging means provided on at least one of said right and left side walls of said cassette case and connected to an adjacent one of said end pieces at a position which is closer to said cassette case than said shaft of said end piece to urge said guard panel towards said cassette case and with said shaft positioned at the intersection of oppositely inclined portions of said V-shaped through-hole, and wherein:

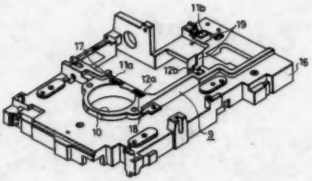
the two halves of said cassette case are symmetrical in configuration.

4,797,769

DISC DRIVING DEVICE

Hiroaki Sasaki; Kazuo Hasegawa; Noboru Fukukawa, and Masanori Yata, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 856,636, Apr. 25, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,655
Claims priority, application Japan, Apr. 25, 1985, 60-87538
Int. Cl.[4] G11B 5/012
U.S. Cl. 360—99.08 3 Claims



1. A disc driving device comprising:

a carriage carrying a magnetic head thereon for movement radially of a disc along a first, horizontal direction of the disc driving device while sliding on a pair of parallel guide shafts extending in the first, horizontal direction; and

a housing for mounting parts of the disc driving device, said housing including a pair of front bearing portions spaced apart from each other in a second horizontal direction perpendicular to said first horizontal direction, each of said front bearing portions being spaced apart and facing opposite a respective one of a pair of rear bearing portions along said first horizontal direction, each of said rear bearing portions corresponding in position to the respective one of said front bearing portions for accurately holding front and rear ends of the respective ones of said pair of guide shafts so that they are mounted in parallel for movement of said carriage thereon, each of said front bearing portions and rear bearing portions being open toward one vertical direction and having a bearing width facing said vertical direction which is suitable for journalling a corresponding end of a respective one of said guide shafts therein;

wherein said rear pair of bearing portions consists of a first rear bearing portion and a second bearing portion, each of said first and second rear bearing portions having a front side facing the corresponding one of said front bearing portions and a rear side facing opposite therefrom,

and said housing further including a relief slot extending from the rear side of the first rear bearing portion then across said second horizontal direction to the rear side of the second rear bearing portion, said relief slot being open toward said vertical direction and having a relief width larger than said bearing width,

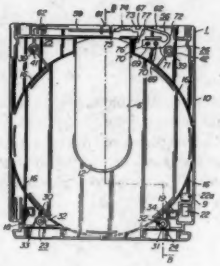
whereby said front and rear pairs of bearing portions are all machined by a cutting tool oriented in said vertical direction and moving in one continuous horizontal movement without backtracking by moving from one of said front bearing portions along the first horizontal direction through the first rear bearing portion to the rear side thereof, then along the relief slot having said larger relief width across the second horizontal direction, to the rear side of and through the second rear bearing portion, then back along the first horizontal direction to the other one of said front bearing portions.

4,797,770

DISK CARTRIDGE WITH RELEASABLE LATCHING SHUTTER

Kenji Takahasi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP86/00184, § 371 Date Feb. 13, 1987, § 102(e) Date Feb. 13, 1987, PCT Pub. No. WO86/06204, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 14, 1986, Ser. No. 6,550
Claims priority, application Japan, Apr. 15, 1985, 60-55761
Int. Cl.[4] G11B 23/03
U.S. Cl. 369—291 10 Claims



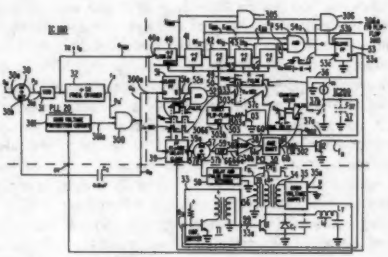
1. A disk cartridge comprising pickup apertures provided in the plane of the cartridge body, a sliding shutter having a bent portion, said sliding shutter having portions for opening or closing said pickup apertures, and a resilient locking member having a locking recess in which said bent portion is engaged when said sliding shutter is in a shutter-closed position so as to lock said shutter, said locking member also having a base portion mounted to said cartridge body and a free end, there being formed in said sliding shutter an unlocking pin insertion aperture adapted to receive an unlocking pin from a recording and/or reproducing apparatus to deflect said free end of said locking member and for sliding the shutter to a shutter-open position, said aperture being disposed aligned with the free end of said locking member when said sliding shutter is in the shutter-closed position.

4,797,771

TELEVISION FAULT DETECTION AND PROTECTION APPARATUS

James H. Doty, II, Indianapolis, and Jeffery B. Lendaro, Noblesville, both of Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Jun. 30, 1987, Ser. No. 68,084
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—88 11 Claims



1. A television apparatus power supply with a fault protection arrangement, comprising:

a source of an input signal at a frequency that is related to a deflection frequency;

means for generation of a fault indicative signal when a fault condition occurs in said power supply;

means responsive to said input signal for generating a first signal at a first terminal during normal operation having transition edges at a frequency that is related to that of said input signal such that when said fault indicative signal is generated, the occurrence of said transition edges of said first signal is prevented, and for generating a second signal at a second terminal, both during normal operation and when said fault indicative signal occurs, at a frequency that is related to that of said input signal;

missing edge detecting means responsive to said first signal for generating a third signal when a transition edge within said first signal is missing;

a source of input supply voltage;

a load;

switching means, switching in response to said second signal and coupled to said load and to said source of input supply voltage for developing an output supply voltage for said load during normal operation; and

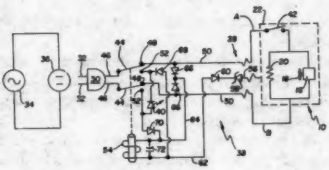
means responsive to said third signal and coupled to said switching means for generating a signal that prevents the occurrence of said switching operation to substantially reduce said output supply voltage when said third signal is generated.

4,797,772

IMMERSION DETECTOR CIRCUIT INTERRUPTER

Kostas Kaplanis, Fort Wayne, Ind., assignor to Patton Electric Company, Inc., New Haven, Ind.

Filed Mar. 3, 1987, Ser. No. 21,185
Int. Cl.[4] H02H 3/16
U.S. Cl. 361—42 **29 Claims**



1. A circuit interrupter which interrupts the delivery of alternating current to an electrical appliance through a plurality of conductors, said circuit interrupter comprising:

switch means connected to each of the conductors for interrupting the delivery of alternating current therethrough to the appliance;

sensor means located substantially near the appliance for conducting electrical current;

coil means connected to said sensor means for actuating said switch means and interrupting the delivery of alternating current to the appliance when said coil means is energized;

a plurality of rectifier means connected in series with said coil means and said sensor means, each rectifier means connected in a parallel fashion to each of the respective conductors for conducting current in one direction through said coil means and said sensor means and for preventing a short circuit between the conductors, whereby current to the appliance is interrupted when said sensor means contacts water or when water bridges the appliance components and said sensor means; and,

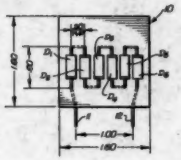
latch means for retaining said switch means actuated and the delivery of alternating current to the appliance interrupted after said coil means actuates said switch means.

4,797,773

SPATIAL ARRAY FILTERING SYSTEM FOR ELECTRICAL DEVICES

Frank D. Honorof, Priest River, and Richard Odenberg, Coeur d'Alene, both of Id., assignors to Transtector Systems, Inc., Hayden Lake, Id.

Continuation of Ser. No. 861,321, May 9, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 183,383
Int. Cl.[4] H02H 9/00
U.S. Cl. 361—58 **11 Claims**



1. A device for protecting electrical circuitry from electrical transients, said device comprising:

a plurality of diodes connected between a pair of electrical terminals, the physical spacing and orientation of said diodes being selected to provide

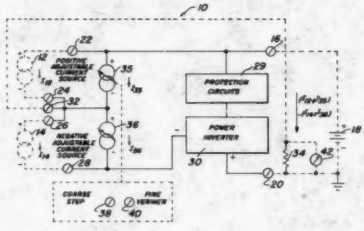
a selectively tailored impedance versus frequency characteristic enabling filtering of undesired noise at frequencies selected for individual applications utilizing said device.

4,797,774

SIGNAL CONDITIONING CIRCUIT

Wilson A. Clayton, La Habra, and Algis P. J. Babilius, Diamond Bar, both of Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 30, 1986, Ser. No. 913,825
Int. Cl.[4] H02H 3/08, 3/20
U.S. Cl. 361—86 **14 Claims**



1. A signal conditioning circuit comprising:

power terminal means adapted to be connected to a direct current power source;

sensor terminal means adapted to receive a direct current signal;

output terminal means adapted to be connected to an electrial resistance;

inverter means connected to said power terminal means for generating an output signal of opposite polarity to the signal received at said power terminal means; and

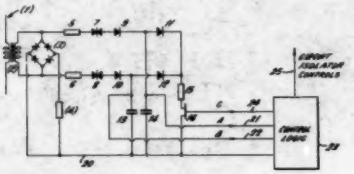
adjustment means connected to said sensor terminal means, said inverter means, said power terminal means and said output terminal means for receiving said inverter output signal and for shifting the scale of the signal received at said sensor terminal means to a desired scale at said output terminal means.

4,797,775

SYMMETRICAL FAULT CURRENT DETECTOR

David R. Aubrey, Sanghall, and Ian Jameson, Wirral, both of United Kingdom, assignors to The Electricity Council, London, England

Filed Apr. 21, 1986, Ser. No. 854,246
Claims priority, application United Kingdom, May 20, 1985, 8512746
Int. Cl.[4] H02H 3/087
U.S. Cl. 361—93 4 Claims



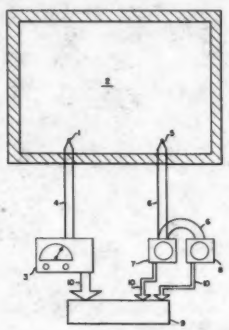
1. A fault current detector comprising:
current transformer means adapted to be inductively coupled to an alternating current power line to provide a signal representative of current flowing in the alternating current power line; and
means responsive to the signal to provide a fault current indication if the alternating current flow represented by the signal exceeds a predetermined threshold in each polarity but not to provide the fault current indication if the alternating current flow exceeds the predetermined threshold in only one polarity.

4,797,776

FURNACE TEMPERATURE SAFETY SYSTEM

William J. Snyder, White Plains, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 12, 1987, Ser. No. 48,879
Int. Cl.[4] F23N 5/24
U.S. Cl. 361—103 16 Claims



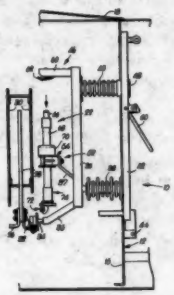
1. Furnace temperature safety system comprising:
(a) first thermocouple means for sensing temperature within a furnace, and means to transmit a signal corresponding to its sensed temperature to furnace temperature reading means;
(b) second thermocouple means for sensing temperature within a furnace, and means to transmit a signal corresponding to its sensed temperature in parallel to both low temperature reading means and high temperature reading means; and
(c) means to transmit the temperature reading from each of the furnace temperature, low temperature, and high temperature reading means to a signal comparator capable of comparing the three readings and making a logical decision based on their present values.

4,797,777

ELECTRONIC SECTIONALIZER AND MOUNTING STRUCTURE FOR SWITCHGEAR

Lloyd R. Beard, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Oct. 20, 1987, Ser. No. 110,966
Int. Cl.[4] H02H 7/22
U.S. Cl. 361—115 13 Claims



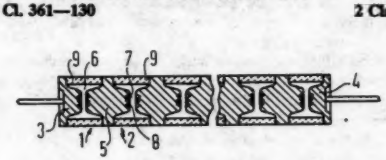
8. Electronic sectionalizer mechanism including:
an elongated element having a first portion and a second portion electrically connected to said first portion;
means for sensing the magnitude of current flowing through said element;
first mounting structure including a first contact engageable with said first portion of said element;
second mounting structure constructed for telescopically receiving said second portion of said element and including a second contact engageable with said second portion of said element;
means for releasably retaining said element in an operating position with said first portion and said second portion of said element in engagement with said first contact and said second contact respectively; and
means coupled to said sensing means for selectively releasing said element from said operating position and for enabling telescopic movement of said element in an essentially longitudinal direction through said second mounting structure in order to shift said first portion of said element away from said first contact and toward an isolated, open circuit position.

4,797,778

GAS DISCHARGE PATH

Juergen Boy, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 58,874
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620344
Int. Cl.[4] H02H 9/06; H01T 4/16
U.S. Cl. 361—130 2 Claims



1. A gas discharge structure for high voltages, high frequen-

cies and high numbers of switching actuations, comprising: at least two series-associated individual arresters; an insulator tube including two openings;

each of said arresters comprising two electrodes which extend into said tube openings of said insulator tube and are connected thereto in a vacuum-tight manner such that said insulator tube and said electrodes form an individual gas discharge gap;

a gas in said gas discharge gap which is partially composed of hydrogen with the hydrogen constituent lying between 5 vol. % and 10 vol. %;

said electrodes including end faces lying opposite one another and an activation compound carried on said end faces, said electrodes comprising solid copper and said electrodes which are adjacent to one another in the series being arranged on the same axis and being a one-piece structure.

4,797,779

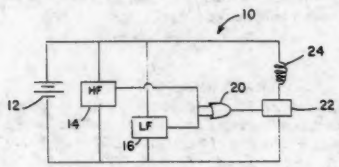
PULSED POWER SUPPLY

James A. Richards, Joliet, and Ronald T. Stefanek, Lockport, both of Ill., assignors to Folger Adam Company, Lemont, Ill.

Filed Oct. 5, 1987, Ser. No. 104,685

Int. Cl.[4] H01H *47/12, 47/32*

U.S. Cl. 361—154 **10 Claims**



1. A power supply for controlling a solenoid actuated lock comprising:

a D.C. voltage source;

a solenoid connected to said voltage source, said solenoid having a coil and a plunger;

means for generating a first train of constant voltage pulses, the first pulse of said train being produced upon application of said D.C. voltage to said generating means and having a first pulse width, and all subsequent pulses having a pulse width less than said first pulse width;

means for generating a second pulse train, the pulses of said train being of constant voltage and of a frequency greater than said first pulse train; and

switching means responsive to said first and second pulse trains for switching current through the coil of said solenoid, said first pulse train acting to seat the plunger of said solenoid, and said second pulse train acting to maintain said plunger in the seated position.

4,797,780

COMPONENT WITH FILLED LAYERS AND ELECTRICAL CONTACTS AND METHODS FOR ITS PRODUCTION

Thomas Moser, Schnaittach; Klaus Otto, Nuremberg; Horst Kippenberg, Herzogenaurach, all of Fed. Rep. of Germany; Johann Ramler, Deutschlandsberg, and Josef Unterlass, Graz, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

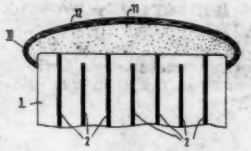
Filed Aug. 18, 1987, Ser. No. 86,564

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627938

Int. Cl.[4] H01G *4/10, 7/00, 1/14*

U.S. Cl. 361—321 **11 Claims**

1. component with filled layers, comprising: a ceramic body of dense and porous layers impregnated by a metal or an alloy impregnating material and having electrical contacts on its outer faces, wherein the contacts contain enrichments of elemental constituents which alloy with the main elemental substance of the contacts to form at least one intermetallic com-



pound which is largely insoluble in the impregnating material, said elemental constituents comprising at least one element selected from the group consisting of indium, gallium and thallium.

4,797,781

EARTHQUAKE RESISTANT HIGH VOLTAGE DEVICE

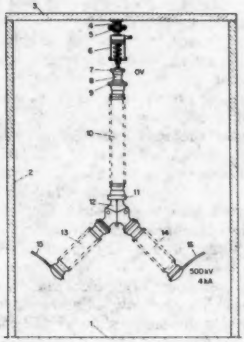
Dietrich Kluge, Waldshut-Tiengen, Fed. Rep. of Germany, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 19, 1987, Ser. No. 124,561

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636009

Int. Cl.[4] H02B *1/00;* H01F *27/06*

U.S. Cl. 361—332 **8 Claims**



7. An earthquake resistant high voltage device having a high potential side and a ground potential side and comprising:

a least one high voltage breaker;

at least one connection from said at least one high voltage breaker to a high voltage line;

at least one high voltage insulator connected between the high voltage side and the ground potential side of said at least one high voltage breaker;

means for rotatably movably suspending the high voltage insulator from the ground potential side of said at least one high voltage breaker;

said rotatably movably suspending means suspending said at least one high voltage breaker from the ground potential side in a reverse position as compared to a normal position in which said at least one high voltage breaker has a grounded base point; and

said at least one high voltage breaker being supported in a substantially zero-load carrying manner on the high voltage side of said at least one high voltage breaker.

4,797,782

ARRANGEMENT IN ONE OR MORE UNITS DISPOSED IN AN OUTER UNIT

Roger Wistling, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

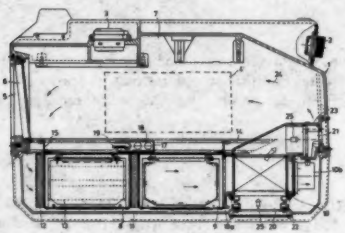
PCT No. PCT/SE86/00443, § 371 Date May 20, 1987, § 102(e) Date May 20, 1987, PCT Pub. No. WO87/02214, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 2, 1986, Ser. No. 54,178

Claims priority, application Sweden, Oct. 3, 1985, 8504570

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—384 **10 Claims**



1. An apparatus comprising:

a portable, low-weighted outer unit defining an inner, dust-free aseptic space housing optical components and heat generating electronic components;

inner units provided in said space and disposed along one inner wall of said outer unit to form a channel having an inlet and outlet positioned close to two opposite inner walls of said outer unit;

at least one, first inner unit encasing said electronic components which are disposed on assembly boards stacked in said first unit;

a second inner unit including a cooler provided with an air heat exchanger;

a first circulation means for circulation of inner air in said space and through said inlet of said channel past said electronic components, said heat exchanger of said cooler unit; said outlet of said channel, said optical components in said space and back to said inlet of said channel;

a second circulation means for drawing in outer air through said heat exchanger and out through an exhaust outlet in said outer unit;

wherein said heat transported from said electronic components by said inner air flow is transferred to said outer air flow whereby the temperature of said inner air in said space is kept reduced.

4,797,783

AIR COOLING EQUIPMENT FOR ELECTRONIC SYSTEMS

Mitsuo Kohmoto, and Yohichi Matsuo, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 780,496, Sep. 26, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 106,891

Claims priority, application Japan, Sep. 26, 1984, 59-199434; Oct. 4, 1984, 59-207135

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—384 **9 Claims**

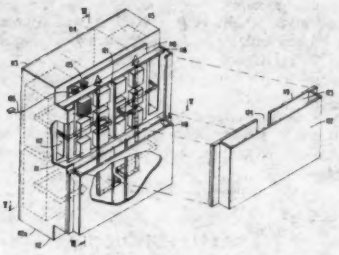
1. Air cooling equipment housing having therein a plurality of wiring boards with a plurality of heat generating electric components mounted thereon, said air cooling equipment housing comprising:

first blower means introducing cooling air from top of the housing;

first air passage means having an intake port, an air passage over at least one of said plurality of wiring boards and an exhaust port, said first air passage means passing the air from said first blower over said one of said plurality of boards wiring and exhausting it;

second blower means introducing cooling air from bottom of the housing;

second air passage means having an intake port, an air passage over at least a second of said plurality of wiring boards and an exhaust port, said second air passage means passing the air from said second blower over said second of said plurality of boards and exhausting it; and



a partition wall separating said first air passage means and said second air passage means.

4,797,784

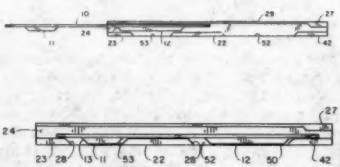
SUBSTRATE MOUNTING DEVICE

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 32,667, Apr. 1, 1987, abandoned. This application Sep. 28, 1987, Ser. No. 101,893

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—395 **8 Claims**



1. A substrate mounting device for mounting an electrical substrate to a carrier substrate comprising:

a first pair of guide rails each mounted on the perimeter edge of said electrical substrate directly opposite each other;

a second pair of guide rails located in a spaced relationship to said first pair of guide rails and each guide rail of said second pair of guide rails mounted on the perimeter edge of said electrical substrate directly opposite each other;

first and second substrate guides mounted to said carrier substrate in a spaced and parallel relationship to each other, each of said substrate guides including a channel longitudinally oriented along a first side thereof, and each of said channels including an open end and a top guide, and each channel extends between said open end and said top guide, said first and second substrate guide channels further defined by a top surface and first and second drop guides, said first and second drop guides located opposite said top surface, and said first and second drop guides further defining first and second guide rail receiving slots;

said electrical substrate and said first and second guide rails arranged to be manually inserted into respective first and

second substrate guide channels at respective channel open ends and manually pushed along said channels riding between respective first and second drop guides and channel top surfaces until said substrate encounters a respective top guide whereby, said first guide rail and said second guide rail fall within respective first and second guide rail receiving slots on each of said first and second substrate guides, resting each of said first and second electrical substrate guide rails on said carrier substrate.

4,797,785

CIRCUIT ARRANGEMENT AND RESONANT LABEL, AND A PROCESS FOR ITS PRODUCTION

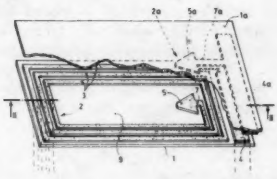
Paul R. Jorgensen, Almunecar, Spain, assignor to Durgo AG, Switzerland

Filed Jul. 29, 1987, Ser. No. 79,579

Claims priority, application Switzerland, Jul. 30, 1986, 3103/86

Int. Cl.[4] H05K *1/16*; H01G *7/00*; C25D *5/02*

U.S. Cl. 361—402 **32 Claims**



1. A circuit arrangement comprising:

a substrate;

a first circuit pattern formed on the substrate which comprises a first circuit section and a second circuit section; and

a second circuit pattern superposed on the first circuit pattern, which comprises a third circuit section and a fourth circuit section;

said second and fourth circuit sections having corresponding size and shape and being separated and adhered by an adhesive insulating material; and

wherein said first and third circuit sections have an adhesive insulating layer therebetween, and crimped portions of at least one of said first and third circuit sections extend through said insulating layer for directly conductively interconnecting said first and third circuit sections.

4,797,786

SUBSTRATE MOUNTING DEVICE

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 32,667, Apr. 1, 1987, abandoned. This application Sep. 28, 1987, Ser. No. 102,239

Int. Cl.[4] H05K *7/02*

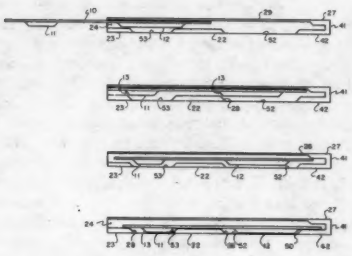
U.S. Cl. 361—419 **8 Claims**

1. A substrate mounting device for mounting an electrical substrate to a carrier substrate comprising:

a first pair of guide rails each mounted on the perimeter edge of said electrical substrate directly opposite each other;

a second pair of guide rails located in a spaced relationship to said first pair of guide rails and each guide rail of said second pair of guide rails mounted on the perimeter edge of said electrical substrate directly opposite each other;

first and second substrate guides mounted to said carrier substrate in a spaced and parallel relationship to each other, each of said substrate guides including a channel longitudinally oriented along a first side thereof, and each of said channels including an open end and a top guide, and each channel extending between said open end and said top guide, and each top guide extending transversely to the other top guide forming an end cap between said first and second substrate guides, said first and second substrate guide channels further defined by a top surface and first and second drop guides, said first and second drop guides located opposite said top surface, and said first and second drop guides further defining first and second guide rail receiving slots;



said electrical substrate and said first and second guide rails arranged to be manually inserted into respective first and second substrate guide channels at respective channel open ends and manually pushed along said channels riding between respective first and second drop guides and channel top surfaces until said substrate encounters a respective top guide whereby, said first guide rail and said second guide rail fall within respective first and second guide rail receiving slots on each of said first and second substrate guides, resting each of said first and second electrical substrate guide rails on said carrier substrate.

4,797,787

LEAD FRAME AND ELECTRONIC DEVICE

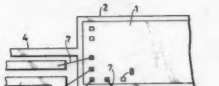
Ichio Shimizu, Gunma, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

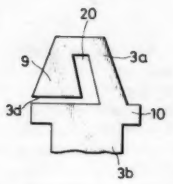
Filed Jul. 23, 1985, Ser. No. 758,030

Claims priority, application Japan, Jul. 25, 1984, 59-152884

Int. Cl.[4] H05K *5/02*

U.S. Cl. 361—421 **13 Claims**





1. A lead frame comprising:

chip supporting means for supporting a chip; and

a plurality of leads arranged around said chip supporting means, each of said plurality of leads having an inner end disposed proximate to said chip supporting means;

said inner end of at least one of said plurality of leads including a first lead portion extending in a direction toward said chip supporting means, a second lead portion contiguous with said first lead portion, said second lead portion extending in a direction away from said chip supporting means, and a third lead portion connected between said first lead portion and said second lead portion, said third lead portion being contiguous with said first and second lead portions and having a first end connected to said first lead portion and a second end connected to said second lead portion with substantially parallel sides extending between said first and second ends thereof, one of said substantially parallel sides being adjacent to and spaced a predetermined distance from a peripheral wall of said chip supporting means facing said first lead portion and extending in a direction in parallel with said peripheral wall, said second lead portion extending from said second end of said third lead portion in a direction away from said chip supporting means so as to have an end part thereof disposed at a position farther away from said peripheral wall of said chip supporting means than the other of said substantially parallel sides of said third lead portion.

4,797,788

ELECTRONIC COMPONENT WITH WIRE CONNECTIONS

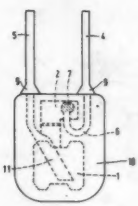
Evert H. L. J. Dekker, Zwolle, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 3, 1987, Ser. No. 57,844

Claims priority, application Netherlands, Jun. 24, 1986, 8601640

Int. Cl.[4] H01G 9/00

U.S. Cl. 361—540 **2 Claims**



1. An electronic component in which connection elements emanating from said component are connected at connection points in said component to electrode ends or electrode coatings and which component is surrounded tightly by a cured polymer envelope provided by means of a solution or suspension or by means of powder sputtering, characterized in that at least one of the connection elements is provided, from its connection point, with a loop which first of all extends in a direction substantially opposite to the emanating direction of said connecting element and towards the electronic component and then extends in said emanating direction.

4,797,789

SOLID ELECTROLYTIC CAPACITOR

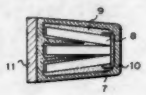
Kazumi Naitoh; Yoshiaki Arakawa, both of Yokohama, and Takashi Ikezaki, Atsugi, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1987, Ser. No. 50,104

Claims priority, application Japan, May 16, 1986, 61-110623; Dec. 27, 1986, 61-309181; Mar. 2, 1987, 62-45322

Int. Cl.[4] H01G 9/00

U.S. Cl. 361—525 **16 Claims**



1. A solid electrolytic capacitor comprising a plurality of superposed etched foils of a valve metal having an oxide film surface layer, which are electrically connected with a positive electrode terminal, a semiconductor layer formed on the entire surface of the oxide film layer, an electroconductive layer formed on the entire surface of the semiconductor layer, and a negative electrode terminal common to the respective foils, which is formed on the electroconductive layer.

4,797,790

DIMMED MOTOR VEHICLE HEADLIGHT

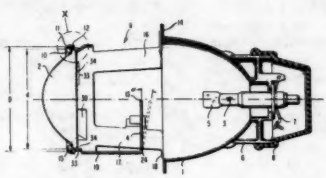
Günter Brödling, Lippstadt; Franz Feyerabend, Paderborn; Peter Hubert; Franz Krühling, both of Lippstadt; Wolfgang Peitz, Erwitte; Karlernst Sewing, Lippstadt-Hörste, and Diethard Schnelle, Erwitte, all of Fed. Rep. of Germany, assignors to Westfälische Metall Industrie KG, Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed May 12, 1986, Ser. No. 862,129

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516812; May 10, 1985, 3516813

Int. Cl.[4] B60Q 1/00

U.S. Cl. 362—61 **27 Claims**



1. A dimmed motor vehicle headlight operable to be mounted on the front of a motor vehicle and having a standard orientation at a motor vehicle comprising:

a light-focussing reflector with a source of light at a focal point of said reflector;

a lens for focussing light;

a stamped sheet metal cup-like frame defining a centermost axis and comprising: first and second open ends, a plurality of arm-like webs extending between said ends, said first end mounted on front of said reflector wherein the lens is supported by said second end via radially inwardly receding connection pieces distributed over the circumference of a ring shaped frame forming support points for the lens inserted from the side with the smaller inner diameter, and a diaphragm having an edge disposed intermediate said ends to form a light-dark border, said diaphragm formed by bending a web having a free end toward said axis, where the frame narrows its inner diameter in the direc-

tion of light outflow, where a smaller inner diameter of the ring-shaped part corresponds to an outer diameter of the lens;

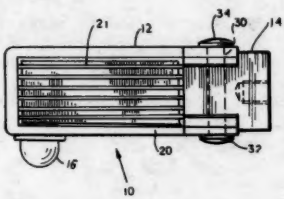
a cracked ring disposed between the radially protruding connection pieces and the inwardly narrowing ring shaped frame under pretensioning, where the cracked ring is pressed against a slot formed by the lens and the ring shaped frame part without resting at the base of the slot and where the cracked ring presses the lens against respective support points.

4,797,791

FOOT PEG WITH LIGHT

Ronald W. Burchick, 348 W. 18th St., Erie, Pa. 16502

Filed Feb. 29, 1988, Ser. No. 162,145
Int. Cl.[4] B62J *6/00*
U.S. Cl. 362—72 **6 Claims**



1. In combination [10], a motorcycle foot peg [12], a bracket [14] and a lamp [16],

said bracket [13] having means [18] for attaching said bracket [14] to a motorcycle frame,

said foot peg [12] comprising a top [20], having a removable foot pad [21] supported on it,

two spaced channel-like side flanges [22,24] attached to said top [20] and extending downwardly from said top [20],

said flanges [22,24] extending toward said bracket [14] forming ears [26,28] and receiving said bracket [14] between said ears [26,28],

hinge pin [30] extending through said ears [26,28] and through said bracket [14], forming a hinge,

said hinge pin [30] having two enlarged ends [32,34] attached to said hinge pin [30],

said enlarged ends [32,34] overlying the ends of said ears [26,28],

an end flange [36] attached to said side flanges [22,24] and extending downwardly therefrom and attached to said side flanges [22,24],

a web [38] between said hinge pin [30] and said flange [36],

said web [38] being fixed to said [20] top and to said side flanges [22,24],

an opening [40] in one said side flange [22] adjacent said end flange [36],

a lamp socket [42] in said opening [40] supporting said lamp [16],

said lamp socket [42] having a lamp base [44],

fastening means [46] on said base [44] overlying outside of said side flange [24] around said opening [40],

said lamp [16] being received in said lamp socket [42],

an electrical line [48] attached to said lamp base [44],

a central opening [50] in said web [38],

rubber grommet means [52] in said central opening [50],

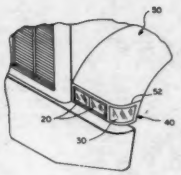
said electrical line [48] extending through said rubber grommet [52] between said hinge pin [30] and said top [20] and adapted to be attached to an electrical system.

4,797,792

FORWARD LIGHT HOUSING ASSEMBLY

Joshua T. Oen, Castro Valley, Calif., assignor to Paccar, Inc., Bellevue, Wash.

Filed Sep. 9, 1987, Ser. No. 95,094
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—83 **16 Claims**



1. A fender arrangement forming part of a motorized vehicle, comprising:

(a) a front fender having a forwardmost end;

(b) a light assembly separate from but adapted for attachment to the front end of said fender so as to form an extension thereof, said assembly including:

(i) at least one headlight,

(ii) a turn signal,

(iii) a light housing module for containing said headlight and said turn signal; and

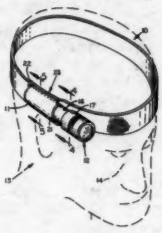
(c) means for attaching said light housing to the front end of said fender whereby the light assembly is incorporated into the contour of the fender.

4,797,793

HEADBAND FOR HOLDING A FLASHLIGHT

Tom R. Fields, 5714 Verner Oak Ct., Sacramento, Calif. 95841

Filed Feb. 24, 1988, Ser. No. 159,676
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—105 **9 Claims**



1. A headband wearable on the head of a user, for retaining a flashlight adjacent to the user's temple and oriented to project a light beam in a forward direction generally in the direction the user is facing, comprising:

a band of elastic, stretchable material formed generally into a loop sized to fit about a user's head when stretched,

the band being formed from a strap of material having two ends, with the ends being overlapped by an overlap distance of sufficient length generally to accommodate the length of a cylindrical portion of a flashlight,

the overlapPed portion of the band being secured along edges of the two layers of strap so as to form a pocket between the two layers, oPen at a forward end, with an outer layer of the straP being at the forward end of the overlapped portion, and

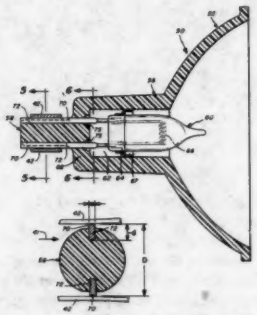
the width of the strap of material being sufficient to accommodate in the pocket a cylindrical portion of a flashlight.

4,797,794

REFLECTOR LAMP

William G. Connor, Peterborough, and Chris Collandris, Hillsboro, both of N.H., assignors to GTE Products Corporation, Danvers, Mass.

Filed Aug. 12, 1987, Ser. No. 84,352
Int. Cl.[4] H01R 33/00
U.S. Cl. 362—226 22 Claims



1. A reflector lamp for being positioned within a device having contacts therein, said reflector lamp comprising:

a reflector member having a reflecting portion and a base neck portion with a stub portion extending therefrom, said stub portion having elongated slots of rectangular cross-section disposed along the exterior of at least a portion of said stub;

a lamp capsule disposed within said base neck portion and having a pair of lead wires extending therefrom for being positioned within said slots of said stub portion;

said pair of lead wires each having, along at least a segment thereof, a rectangular cross-section of dimension sufficient to provide a snug fit within a respective one of said slots within said stub portion;

said lead wires being disposed within said respective slots to a depth sufficient to maintain an interlock therebetween despite exertion of compressive forces imposed on said leads by said contacts within said device which open and close against said lead wires, said lead wires being so disposed within said slots without the requirement of adhesive between said lead wires and slots.

4,797,795

CONTROL SYSTEM FOR VARIABLE PARAMETER LIGHTING FIXTURES

Michael Callahan, 201 W. 85th St., New York, N.Y. 10024

Continuation of Ser. No. 750,873, Jul. 1, 1985, Pat. No. 4,697,227, which is a continuation-in-part of Ser. No. 443,127, Nov. 19, 1982, Pat. No. 4,527,198. This application Jun. 25, 1987, Ser. No. 66,790
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] G03B 15/02
U.S. Cl. 362—233 20 Claims

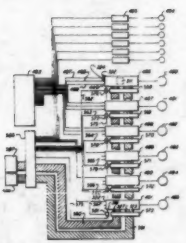
1. A control system for a lighting system, said lighting system including: a plurality of light projectors, said projectors each generating a beam suitable for entertainment lighting and illuminating a common area, and each of a first plurality of said plurality of projectors provided with means to vary a plurality of parameters of said beam, such as the pan, tilt, size, shape, color and focus of said beam, and with means to conform, said means to conform operable from a remote location, having an input, having an output coupled to said means to vary, and cooperating with said means to vary to produce a desired adjustment of said parameters of said beam in response to the presense of a corresponding first value set at said input; and each of a second plurality of said plurality of projectors provided with dimming means for adjusting the intensity of said beam, said dimming means having a control input and capable of producing a desired adjustment of the intensity of said beam of at least one of said projectors in response to the presense of a corresponding third value at said control input, said control system comprising:

(a) at least one first controller, said first controller adapted to the requirements of the control of said plurality of parameters of said beam of a light projector, said first controller comprising at least:

(i) at least one short-term memory capable of storing at least five of said first value sets, each of said first value sets corresponding to the desired adjustment of said plurality of said parameters of said beam of at least one of said first plurality of projectors in at least one desired lighting effect;

(ii) at least one means adapted for entering at least one of said first value sets corresponding to a desired adjustment of said parameters for at least one of said projectors, said means adapted for entering disposed at and operable from a location remote from said projector and having at least one output;

(iii) means, coupled to said at least one output of said means adapted for entering and to said short term memory, cooperating with said means for entering to store said first value set entered by said means for entering in said short-term memory, and further for associating said first value set with at least one second value identifying a desired lighting effect;



(iv) means, having a selection input, for causing said control system to produce said first value set stored in said short-term memory at said input of said means to conform in response to the presense of an associated second value identifying a desired lighting effect at said selection input;

(b) a second controller, said controller having at least one output suitable for coupling to said control input of said dimming means, adapted for the adjustment of values corresponding to desired intensity values, said first and said second controller each capable of functioning substantially independent of the other, said second controller comprising at least:

(i) at least one short-term memory capable of storing a plurality of digitally-encoded third values corresponding to desired intensity adjustments for each of a plurality of light projectors in each of a plurality of desired lighting effects;

(ii) at least one means for entering said third values corresponding to desired intensity adjustments in at least one lighting effect for at least one of said projectors, said means for entering having at least one output;

(iii) means, coupled to said at least one output of said means for entering and to said short term memory, cooperating with said means for entering to store said third values corresponding to desired intensity values entered by said means for entering in said short-term memory, and further

for associating said desired intensity values with at least one additional value identifying said lighting effect;

(iv) means, having a selection input, for causing said second controller to produce said desired intensity value stored in said short-term memory at said output suitable for coupling in response to the presense of said additional value identifying said desired lighting effect at said selection input;

(v) a first means for selecting a desired lighting effect to be reproduced, said means for selecting disposed at a location remote from said projectors, having at least a first output coupled to said selection input of said means for causing of said second controller, and capable of producing a plurality of said additional values at said first output, each of said additional values associated with a desired lighting effect;

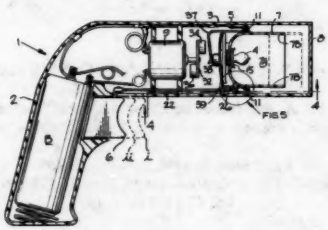
(c) electronic means for coupling at least said first and said second controllers and for automatically producing the substantially simultaneous presense of a value associated with a given lighting effect at said selection input of said means for causing of one of said controllers and of said value associated with the same lighting effect at said selection input of said means for causing of the other of said controllers, such that the selection of a desired lighting effect may result in the presense of said corresponding first value set at said input of said means to conform and said corresponding third values at said control input of said dimming means.

4,797,796

ELECTRIC LANTERN WITH OSCILLATING FEATURE

Lewis K. Eastman, II, Parker, and Robert L. Bromley, Boulder, both of Colo., assignors to L. Kent Eastman Co., Inc., Parker, Colo.

Filed Nov. 9, 1987, Ser. No. 118,607
Int. Cl.[4] F21L 7/00
U.S. Cl. 362—199 21 Claims



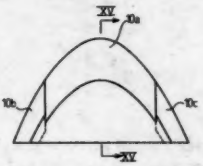
1. An electric lantern comprising an optical system for projecting a beam of light, an energy source, a switch operated by the operator of said lantern for selectively connecting said energy source to said optical system, means for oscillating said optical system, and means for selectively activating said oscillating means whereby said means for oscillating, when activated, causes said beam to scan back and forth at oscillation frequencies such that illumination of a relatively wide swath appears to the operator of said electric lantern to be continuous, whereby said beam can be made to illuminate said relatively wide swath.

4,797,797

DIPPED HEADLAMP FOR MOTOR VEHICLES

Pierre Collot, Pantin, and Norbert Brun, Bobigny, both of France, assignors to Cibie Projecteurs, France

Continuation of Ser. No. 755,070, Jul. 15, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 67,432
Claims priority, application France, Jun. 7, 1985, 85 08655
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—348 5 Claims



1. A dipped headlamp for motor vehicles comprising a bulb and a reflector having a reference axis and a closure glass placed in front of the bulb ad the eflector, and adapted to create a light beam under a cut-off defined in a standardized vertical transverse screen by two horizontal half-lines at different heights, and on the opposite sides of a vertical center line, the left-hand half-line being at the lower level;

said bulb being an axial filament bulb with its light-emitting surface completely exposed,

said reflector comprising a reflecting surface without any discontinuity and forming on said screen images of the filament such that substantially all points of said images are below a horizontal line contained in said screen and intersecting the reflector axis, and the side portions of the reflector forming images of the filament smaller than the center portion thereof,

the axis of the filament and the axis of the reflector being both inclined downwardly with respect to the horizontal in such manner that said horizontal line is at the same level as the lower half-line of the cut-off,

the axis of the filament and the axis of the reflector being further inclined to the right at an angle corresponding to about one half of the horizontal extent of said concentration images, and

the headlamp further comprising correction means associated with said side portions of said reflector for angularly displacing said concentration images upwardly to the level of the right-hand upper half-line.

4,797,798

MEDICAL EXAMINING LAMP

Eugene J. Schumaker, Milwaukee, and Christopher J. Klug, West Allis, both of Wis., assignors to Adjustable Fixture Co., Milwaukee, Wis.

Filed Apr. 10, 1987, Ser. No. 36,923
Int. Cl.[4] F21S 1/12
U.S. Cl. 362—413 5 Claims

1. A lamp includes a first tubular member and a second tubular member telescopingly received within the first member, a lamp socket coupled to the opposite end of one of said members and the opposite end of the other member being secured to a support, a spring assembly mounted at the telescoped end of the second tubular member and including a pair of leaf springs having an end portion disposed within the second tubular member, said leaf springs diverging outwardly from the end of the second tubular member, at least one opening formed in the end portions of said leaf springs, and retaining means extending into said openings for retaining the leaf springs in said second tubular member, said leaf springs resiliently engaging the inner surface of the first tubular member to permit axial and rotational relative movement of the tubular

members but retaining the tubular members in their adjusted positions, said second tubular member being deformed in-

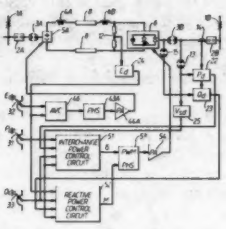
wardly for engaging the end portions of said leaf springs extending into said openings for clamping and retaining the leaf springs in the end of the second tubular member.

4,797,799

POWER CONVERTER

Haruhisa Inokuchi, Kunitachi, and Takami Sakai, Tokorozawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 10, 1988, Ser. No. 154,312
Claims priority, application Japan, Feb. 13, 1987, 62-31061
Int. Cl.[4] H02M 5/45
U.S. Cl. 363—37 **4 Claims**



1. A power converter device that interchanges power between a first A.C. system and a second A.C. system, comprising:

an externally commutated power converter which converts A.C. power supplied from the first A.C. system to D.C. power on a D.C. line;

a voltage type self-commutated power converter which converts the output D.C. power of said externally commutated power converter to A.C. power under pulse width control and supplies the converted A.C. power to the second A.C. system, said D.C. line effecting electrical coupling between said externally commutated power converter and said voltage type self-commutated power converter;

D.C. voltage control means for determining the control angle of said externally commutated power converter such that the D.C. voltage of said D.C. line tracks a first reference value;

interchange power control means for controlling the phase difference angle of the voltage on the A.C. side of said voltage type self-commutated power converter and the voltage of the second A.C. system such that the interchange power between the first A.C. system and the second A.C. system tracks a second reference value; and

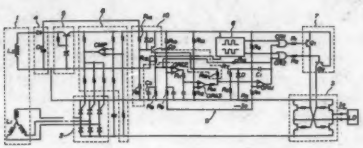
reactive power control means for controlling the control factor of the pulse width control such that the reactive power generated by said voltage type self-commutated power converter tracks a third reference value.

4,797,800

POWER REGULATING SYSTEM FOR AN ENGINE GENERATOR

Motohiro Simizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 147,244
Claims priority, application Japan, Jan. 26, 1987, 62-13153; Jan. 26, 1987, 62-15848
Int. Cl.[4] H02M 5/458; H02H 7/10
U.S. Cl. 363—37 **12 Claims**



1. In a power generating system for an engine generator provided with an engine, an AC generator driven by the engine, and an inverter for reconverting a rectification output of a main output winding of the AC generator into an alternating current of arbitrary frequency according to a driving signal, the improvement comprising an overcurrent detecting means for detecting an overcurrent state of the inverter on the basis of the result of comparison between a detected value of the current carried to said inverter and a reference value, an inverter protecting means for protecting the inverter from the overcurrent state when detected by cutting off said driving signal and thus inactivating the inverter, and an automatic reference value setting means for automatically changing said reference value stepwise to thereby set an optimal reference value in accordance with the ON/OFF state of a semiconductor switching element which is turned ON/OFF on the basis of the result of comparison between a signal based on a voltage which changes in accordance with a rectification output of an auxiliary output winding of the AC generator and a signal based on a voltage obtained by stabilizing the rectification output.

4,797,801

PLURAL POLYPHASE INVERTER UNITS HAVING TONED INPUT FILTERS

Takeshi Furuhashi, Tokyo, and Yoshio Kamei, Yoshikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 162,904
Claims priority, application Japan, Mar. 3, 1987, 62-46886
Int. Cl.[4] H02M 1/14
U.S. Cl. 363—43 **3 Claims**

1. A polyphase inverter comprising:

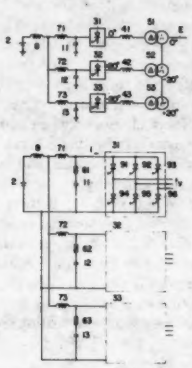
a plurality of unit inverters;

a plurality of filter capacitors provided at respective d.c. input sections of said unit inverters;

a plurality of fuses inserted in series with said filter capacitors, respectively;

a filter circuit including a plurality of reactors inserted into d.c. side circuits of said unit inverters for protection coordination of said fuses, and having a resonance frequency selected so that it is equal to a frequency obtained by the product of the number of pulses per each of said unit inverters, the number of said unit inverters, and the output fundamental frequency;

reactors in the respective output paths of said unit inverters; and



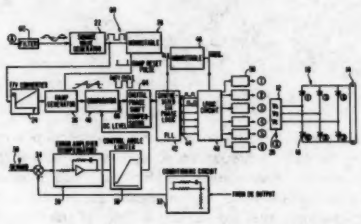
a plurality of transformers for synthesizing outputs of said plurality of unit inverters, thus to provide a single output.

4,797,802

MULTIPLE PHASE RECTIFIER WITH ACTIVE FILTER FOR REMOVING NOISE IN TRIGGERING SIGNALS AND DIGITAL PHASE SHIFT COMPENSATOR FOR PHASE SHIFTING SIGNAL PASSED THROUGH

Chai-Nam Ng, and John J. Dhyanchand, both of Rockford, Ill., assignors to Sundstrand Corp., Rockford, Ill.

Filed Dec. 3, 1987, Ser. No. 128,445
Int. Cl.[4] H02M *1/084*
U.S. Cl. 363—87 7 Claims



1. A converter for converting a multiple phase variable frequency AC voltage produced by a variable frequency multiple phase voltage source into a DC voltage comprising:

(a) a multiple phase full wave rectification bridge having a pair of switches associated with each of the phases with each of the switches having a conductivity controlled by a switching signal, each switch conducting current from one of the phases to an output when the switching signal has a predetermined polarity and reverting to a blocking state when the flow of current drops to zero;

(b) low pass filtering means, coupled to the multiple phase voltage source, for producing a reference signal having a frequency equal to the variable frequency of the variable frequency AC voltage source with the reference signal having a constant phase shift independent of variation in frequency of the voltage source with respect to a signal from the variable frequency multiple phase voltage source;

(c) means, coupled to the filtering means, for phase shifting the reference signal by a fixed phase throughout the variable frequency range of the variable frequency multiple phase voltage source which compensates for the phase introduced by the low pass filtering means and producing a timing signal with the fixed phase, the means for phase shifting the reference signal comprising a phase shifter responsive to a signal having a frequency identical to the variable frequency AC voltage and producing the timing signal; and

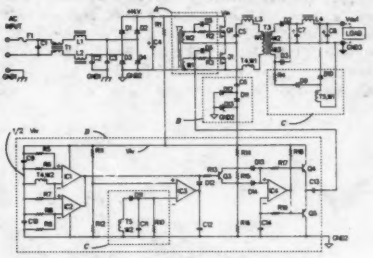
(d) switching signal generation means, responsive to the timing signal, for generating the switching signals of the full wave rectification bridge.

4,797,803

SWITCHING POWER SUPPLY VCO

David T. Carroll, Sonoma, Calif., assignor to DCI Technology, Sonoma, Calif.

Filed Dec. 23, 1987, Ser. No. 137,788
Int. Cl.[4] H02M *3/24*
U.S. Cl. 363—95 5 Claims



1. A voltage controlled oscillator (VCO) of the type used in a symmetrical switching power supply wherein the frequency of a squarewave control signal produced at an output terminal of said VCO, said control signal controlling a switching means to drive current symmetrically positive and negative through a magnetic device, controls a DC output voltage of said power supply, and wherein said frequency of said control signal is controlled by a VCO input signal, said VCO comprising:

a voltage comparator means having a plus(+) terminal and a minus(−) terminal, wherein if a voltage at said plus(+) terminal exceeds a voltage at said minus(−) terminal, said output terminal of said voltage comparator means will be at a high voltage, and if said voltage at said minus(−) terminal exceeds that voltage at said plus(+) terminal, said output terminal of said voltage comparator means will be at a low voltage;

a first resistor with one end coupled to said output terminal of said voltage comparator means;

a capacitor coupled between said resistor and a ground wherein said capacitor is coupled to said minus(−) terminal of said voltage comparator means, wherein said capacitor charges up when said output terminal of said voltage comparator means is at a high voltage and discharges when said output terminal of said voltage comparator means is at a low voltage;

a voltage divider formed by a plurality of resistors for providing a high bias voltage and a low bias voltage corresponding to voltages at each end of one of said plurality of resistors, wherein each end of said one of said plurality of resistors is coupled to sai plus(+) terminal of said voltage comparator means via a diode, and wherein said plus(+) terminal of said voltage comparator means is also coupled to said output terminal of said voltage comparator means via a second resistor so that when said output terminal of said voltage comparator means is at a high voltage, said high bias voltage will be coupled to said plus(+) terminal, and when said output terminal of said voltage comparator means is at a low voltage, said low bias voltage will be

coupled to said plus(+) terminal, resulting in said capacitor charging to approximately said high bias voltage when said output terminal of said voltage comparator means is at a high voltage and discharging to said low bias voltage when said output terminal of said voltage comparator means is at a low voltage; and,

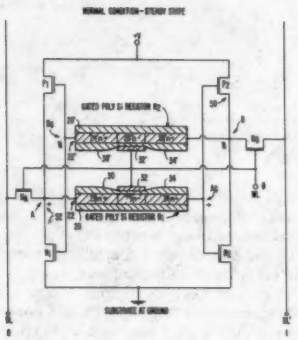
a transistor means coupled to said voltage divider for shunting said one of said plurality of resistors forming said voltage divider and controlling the voltage difference between said high bias voltage and said low bias voltage, in response to said VCO input signal applied to a control terminal of said transistor, in order to control the frequency of said voltage at said output terminal of said voltage comparator means, said voltage at said output terminal being a squarewave.

4,797,804

HIGH DENSITY, HIGH PERFORMANCE, SINGLE EVENT UPSET IMMUNE DATA STORAGE CELL

Leonard R. Rockett, Jr., Washington, D.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1987, Ser. No. 23,426
Int. Cl.[4] G11C *7/00, 7/02*
U.S. Cl. 365—154 **4 Claims**



1. A CMOS flip-flop storage cell having an enhanced immunity to single event upset conditions, comprising:

a first CMOS inverter circuit including a P channel FET device connected between a first storage node and a relatively positive potential and a first N channel FET device connected between said first storage node and a relatively negative potential, with the gates of said first P channel and first N channel devices connected in common to a first gate node and with said first storage node selectively connected to a first binary signal source by a write enable signal;

a second CMOS inverter circuit including a second P channel device whose source drain path is connected between a second storage node and said positive potential and a second N channel FET device having its source drain path connected between said second storage node and said relatively negative potential with said gates of said second P channel and said second N channel devices connected to a second gate node and said second storage node being selectively connected to a second binary signal source of opposite polarity to said first binary signal source by means of said write enable signal;

a first gated polysilicon resistor having its primary conduction path connected between said first storage node and said second gate node and its control electrode connected to said write enable signal;

a second gated polysilicon resistor having its primary conduction path connected between said second storage node and said first gate node and having its control electrode connected to said write enable signal;

said first gated polysilicon resistor and said second gated polysilicon resistor having a relatively high resistance state when said write enable signal is off, thereby providing a high impedance between said first storage node and said second gate node and a high impedance between said second storage node and said first gate node which minimizes the transfer of charge between said first inverter and said second inverter during single event upset conditions;

said first gated polysilicon resistor and said second gated polysilicon resistor assuming a low resistance state when said write enable signal is on, thereby enabling charge transfer between said first storage node and said second gate node and charge transfer between said second storage node and said first gate node for write operations during normal conditions;

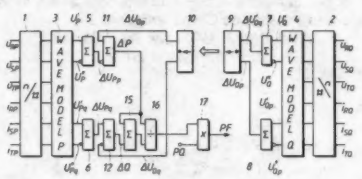
whereby the resistance of said circuit to single event upset conditions is enhanced and the writing speed of the circuit is not impaired.

4,797,805

FAULT LOCATION IN A POWER SUPPLY NETWORK

Gunnar Nimmersjö, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Dec. 18, 1986, Ser. No. 942,990
Claims priority, application Sweden, Dec. 20, 1985, 8506061-4
Int. Cl.[4] G06F *15/20, 15/56*
U.S. Cl. 364—481 **11 Claims**



1. A method for locating a fault on an electrical power line extending between a first and a second station included in a power transmission system, in which at each end point of the line, measurement is made of the instantaneous values of the current flowing in the line and the voltage of the line, which values are converted into corresponding digital values and are supplied to each respective station to produce in accordance with a travelling wave model of the line the instantaneous voltage distribution along the transmission line, as seen from the first and from the second station, comprising:

determining the difference between the present line voltage and the line voltage at an immediately preceding time and when a fault is indicated by the difference exceeding a pre-set threshold value in either station,

generating a first value in the first station representing the difference between the voltage in the second station, calculated in the travelling wave model in the first station with values of the currents and voltages measured in the first station and the corresponding voltage at an immediately preceding time,

generating a similar second value in the second station for the first station using the travelling wave model in the second station, and

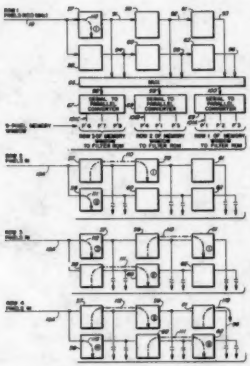
transmitting one of said first and second values to the station in which it was not generated and used there in digital form to compute where the fault lies on the line relative to said station.

4,797,806

HIGH SPEED SERIAL PIXEL NEIGHBORHOOD PROCESSOR AND METHOD

David M. Krich, Peoria, Ariz., assignor to GTX Corporation, Phoenix, Ariz.

Filed Feb. 19, 1987, Ser. No. 16,230
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—900 16 Claims



1. A method of filtering a stream of serial input data arranged as a plurality of alternate odd and even numbered segments each corresponding, respectively, to a plurality of odd and even numbered rows of the data, the method comprising the steps of:

(a) providing a first group of FIFO memories including first, second, and third FIFO memories and a second group of memories including fourth, fifth, and sixth FIFO memories;

(b) serially shifting bits of a first odd numbered segment out of the third FIFO memory and simultaneously serially shifting bits of a second odd numbered segment out of the first FIFO memory into the second FIFO memory, and simultaneously serially shifting bits of a first even numbered segment out of the fifth FIFO memory into the sixth FIFO memory, and simultaneously serially shifting bits of a second even numbered segment into the fourth FIFO memory;

(c) simultaneously with step (b), serially shifting bits of the first odd numbered segment, the first even numbered segment, and the second odd numbered segment into first, second, and third serial-to-parallel converters;

(d) serially shifting bits of the first even numbered segment out of the sixth FIFO memory, simultaneously serially shifting bits of the second odd numbered segment out of the second FIFO memory into the third FIFO memory, simultaneously serially shifting bits of the second even numbered segment out of the fourth FIFO memory into the fifth memory, and simultaneously serially shifting bits of a third odd numbered segment into the first FIFO memory;

(e) simultaneously with step (d), serially shifting the bits of the first even numbered segment, the second odd numbered segment, and the second even numbered segment into the first, second, and third serial-to-parallel converters;

(f) repeating steps (b) through (e) for successive alternate odd numbered and even numbered segments; and

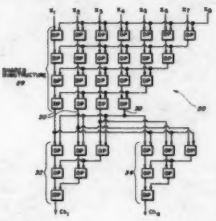
(g) repetitively operating upon outputs of the first, second, and third serial-to-parallel converters to address a read only memory storing filtering table, and producing a serial stream of filtered data at the data rate of the serial input data at an output of the read only memory.

4,797,807

MULTIPLE CHANNEL FAST ORTHOGONALIZATION NETWORK

Karl Gerlach, Dunkirk, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1985, Ser. No. 761,648
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—724.07 5 Claims



1. A fast orthogonalization network for orthogonalizing N inputs with respect to each other, where $N=2^m$ and $m=2$, said network comprising:

first means responsive to a root structure of the N inputs in input order 1 to N for partially orthogonalizing said root structure inputs with respect to their common inputs so that the 1 to 2^{m-1} inputs are decorrelated with respect to inputs 2^{m-1} to 2^m;

second means responsive to an inverted root structure of the N inputs in input order N to 1 for partially orthogonalizing said inverted root structure inputs with respect to their common inputs so the 2^m to $2^{m-1}+1$ inputs are decorrelated with respect to inputs 1 to 2^{m-1};

third means responsive to a first root substructure of inputs 1 to 2^{m-1} from said first means for orthogonalizing said first root substructure so input 1 is decorrelated with respect to input 2^{m-1};

fourth means responsive to a second root substructure of inputs 1 to 2^{m-1} from said first means for orthogonalizing said second root substructure so input 2^{m-1} is decorrelated with respect to input 1;

fifth means responsive to a first inverted root substructure of inputs 2^m to $2^{m-1}+1$ from said second means for orthogonalizing said first inverted root substructure so input 2^m is decorrelated with respect to $2^{m-1}+1$; and

sixth means responsive to a second inverted root substructure of inputs 2^m to $2^{m-1}+1$ from said second means for orthogonalizing said second inverted root substructure so input $2^{m-1}+1$ is decorrelated with respect to input 2^m.

4,797,808

MICROCOMPUTER WITH SELF-TEST OF MACROCODE

Jeffrey D. Bellay; Kevin C. McDonough, and Michael W. Patrick, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 22, 1981, Ser. No. 276,421
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—200 10 Claims

1. A microcomputer device formed in a single semiconductor integrated circuit (10) with internal self-test of instruction code, comprising:

a CPU having an ALU (14) with a plurality of address/data registers (15) and bus means (16) for accessing the registers and input/output for the ALU,

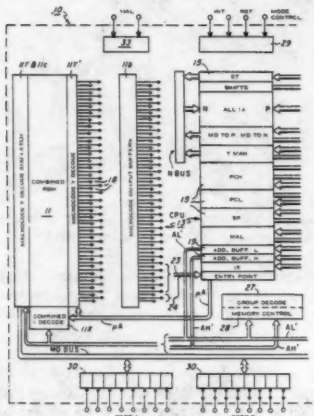
control means including an instruction register (IR) for defining the operation of the CPU in response to multi-bit instruction code words, said control means including means (17) for generating control signals from said in-

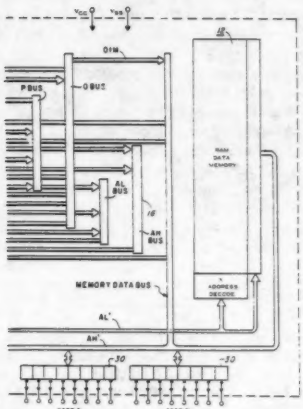
struction code words which are transferred into said instruction register (IR),

program storage means (11) in the integrated circuit for permanently storing a plurality of instruction code words and a check-code representation of all of the bits in all of said plurality of instruction code words,

read/write storage means (12) in the integrated circuit (10) for temporarily storing data or storing other instruction code words,

means for transferring (MD) sequences of said instruction





code words into said instruction register either from said program storage means (11) or from said read/write storage means (12),

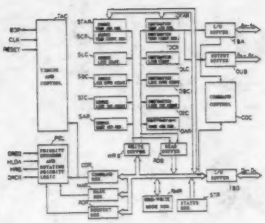
said CPU and control means accessing said other instruction code words from said read/write memory (12) to perform a sequential operation on all of the bits in all of said plurality of instruction code words and to generate a first output (30) from the device if a result of such operation corresponds to said check-code representation and a second output (30) from the device if such result does not correspond to said check-code representation.

4,797,809

DIRECT MEMORY ACCESS DEVICE FOR MULTIDIMENSIONAL DATA TRANSFERS

Kei Sato, Yokohama, and Noboru Murayama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 646,502, Aug. 31, 1984, abandoned.
This application Nov. 4, 1987, Ser. No. 118,712
Claims priority, application Japan, Sep. 7, 1983, 58-164520
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 6 Claims



1. A direct memory access device for transferring data from a first storage location to a second storage location within a memory device, said direct memory access device comprising:

first storing means for storing the start address at said storage location of data to be transferred;

second storing means for storing the start address at said second storage location where said data is to be transferred;

source line counting means for indicating the number of first data lines of predetermined length to be read from said first storage location;

destination line counting means for indicating the number of second data lines of predetermined length to be written to said second storage location;

first line byte holding means for storing information indicating how many bytes of data to be transferred are in each of said first lines;

first line storing means for storing information indicating how many of said first lines constitute each of a plurality of source blocks of data to be transferred;

second line byte holding means for storing information indicating how many bytes of data are in each of said second lines;

second line storing means for storing information indicating how many of said second lines constitute each of a plurality of destination blocks of data to be written into said second storage location;

first increment storing meaans for storing the size of the address increment to move from one start address to another in said first storage location;

second increment storing means for storing the size of the address increment to move from one start address to another in said second storage location; and

control means responsive to the information stored in said first storing means, said source line counting means, said first line byte holding means, said first line storing means, and said first increment storing means for transferring said source blocks of data as a series of first lines in accordance with the information in said first line storing means, said transfer being from said first storage location by addressing the start address of the first of said source blocks and then addressing the start address of each subsequent source block at an address location determined by the size of the increment stored in said first increment storing means and said control means further responsive to the information stored in said second storing means, said destination line counting means, said second line byte holding means, said second line storing means, and said

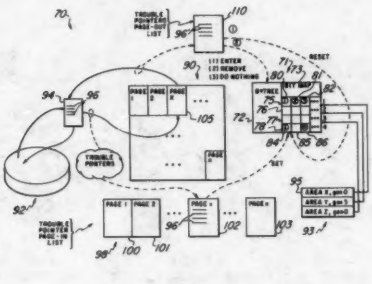
second increment storing means for writing said destination blocks of data as a series of second lines in accordance with the information in said second line storing means into said second storage location by addressing the start address of the first of said destination blocks and then addressing the start address of each subsequent destination block at an address location determined by the size of the increment stored in said second increment storing means.

4,797,810

INCREMENTAL, MULTI-AREA, GENERATIONAL, COPYING GARBAGE COLLECTOR FOR USE IN A VIRTUAL ADDRESS SPACE

Timothy J. McEntee, Garland; Robert W. Bloemer, Dallas; Donald W. Oxley, Carrollton, and Satish M. Thatte, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1986, Ser. No. 878,551
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—200 **11 Claims**



1. A method for managing a virtual memory of a computer system, such virtual memory having a main memory and a backing store, and a plurality of virtual pages in each of the main memory and the backing store, comprising the steps of:

(a) dividing the virtual memory into at least two areas, each area containing a plurality of pages, and capable of storing a plurality of objects;

(b) dividing each area into at least two generations, each generation containing a plurality of pages, and capable of storing a plurality of objects, wherein the generations in each area are ordered from youngest to oldest, with an older generation containing objects which have survived more garbage collection processes than those contained in a younger generation;

(c) for each generation within each area, providing a first trouble pointers data structure which identifies the locations of trouble pointers for that generation, wherein a trouble pointer is considered to be (1) a pointer from within the same area but originating from an older generation, or (2) a pointer originating from another area;

(d) providing a second trouble pointers data structure which indicates, for each page currently located in the main memory, whether that page has contained, since such page was last loaded into the main memory, any pointers which are trouble pointers for another generation or area;

(e) whenever a page is copied into the main memory from the backing store, scanning such page for pointers to other areas or younger generations within the same area, whereby any pointers so found are trouble pointers;

(f) for each page in which trouble pointers are found in step (e), providing a trouble pointers page-in list containing all trouble pointers which were found in step (e);

(g) whenever a page is copied from the main memory to the backing store, scanning such page for trouble pointers as in step (e), and comparing any trouble pointers so found with the trouble pointers page-in list provided in step (f);

(h) whenever step (g) indicates that a page being written to the backing store has different trouble pointers that when that page was copied into the main memory, updating the first trouble pointers data structures of the generations, which are referenced by those trouble pointers which have been changed; and

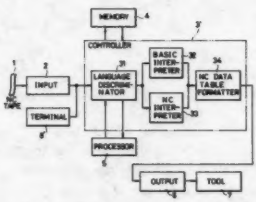
(i) periodically performing garbage collection on generations within areas, wherein each such generation has a root set which includes all trouble pointers into that generation as defined by the corresponding first trouble pointers data structure, and wherein all pages which are indicated by the second trouble pointers data structure as having contained trouble pointers are scanned for trouble pointers which point to the generation being collected, with any such pointers being included in the root set thereof.

4,797,811

DUAL LANGUAGE NUMERICAL CONTROLLER

Morio Kiyokawa, and Akihiko Fujimoto, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 592,491, Mar. 22, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 30,295
Claims priority, application Japan, Mar. 22, 1983, 58-47475
Int. Cl.[4] G05B *19/02*; G06F *9/06*
U.S. Cl. 364—200 **12 Claims**



1. A numerical control device for controlling an object (7) by a numerical control system, comprising:

means for inputting in a single flow a machining program including NC language instructions and general purpose high level language instructions;

control section means (3') for interpreting said instructions inputted by said inputting means and setting NC instruction data as an NC data table in the order the instructions are inputted; and

output section means (6) for applying said NC instruction data set by said control section to said object under control;

wherein said control section means comprises:

language discriminating section means receiving said instructions (31) for discriminating languages used for forming said program;

NC language interpreting means coupled to said language discriminating section means (33) for interpreting and processing machine programs of NC language instructions which are discriminated by language by said language discriminating section and for forming NC instruction data;

high level language interpreting means coupled to said language discriminating section means (32) for interpreting and processing a machining program of high level language instructions which are discriminated by language by said language discriminating means and for forming said NC language data; and

NC data table forming means coupled to said NC language interpreting means and said high level language

interpreting means (34) for forming said NC instruction data formed by said NC interpreting means and said NC instruction data formed by said high level language interpreting means into NC instruction data in the form of a data table in the order in which said language instructions are inputted.

4,797,812

SYSTEM FOR CONTINUOUS DMA TRANSFER OF VIRTUALLY ADDRESSED DATA BLOCKS

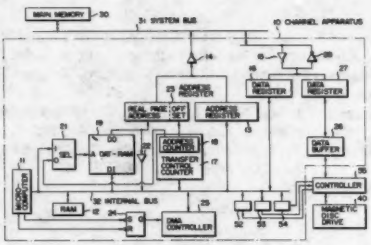
Jyunichi Kihara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 16, 1986, Ser. No. 874,995

Claims priority, application Japan, Jun. 19, 1985, 60-133401; Jun. 19, 1985, 60-133402; Jun. 19, 1985, 60-133403

Int. Cl.[4] G06F *12/08, 13/00*

U.S. Cl. 364—200 **26 Claims**



1. A channel apparatus for effectively performing a DMA transfer of input data to an external memory, comprising:

DMA transfer means for holding an input initial value of a DMA address including offset data and a read storage address, said DMA transfer means comprising:

means for performing the DMA transfer of the input data to the external memory in a read mode in accordance with an input transfer start instruction while the input data is being input from an external device,

means for generating a memory request to output the generated request with the held DMA address every time a DMA transfer of a word of the input data is performed, and

means for incrementing said held DMA address by one every time an output is made to said held DMA address;

real address storage means for receiving designated real block address (RBA) data and a write storage address to store the designated RBA data at said write storage address in a write mode, comprising:

means for receiving said DMA address from said DMA transfer means in said read mode, and

means for outputting to the external memory a real address produced in combination with the offset data in said received DMA address and the stored RBA data at said read storage address in said received DMA address in response to said memory request; and

transfer control means responsive to an input data transfer command, for translating virtual block address data designated by a channel command word (CCW) into RBA data, to store the translated RBA data, comprising:

means responsive to the CCW for commanding the DMA transfer of the input data over a plurality of subsequent blocks of said external memory,

means for setting said real address storage means in the write mode,

means for designating a predetermined number of the translated RBA data to sequentially output the designated RBA data with the write storage address to said real address storage means in the write mode,

means for incrementing the write storage address by one each time the write storage address is output,

means for outputting the initial value of the DMA address to said DMA transfer means, and

means for setting said real address storage means in the read mode to output the transfer start instruction to said DMA transfer means in the read mode.

4,797,813

CACHE MEMORY CONTROL APPARATUS

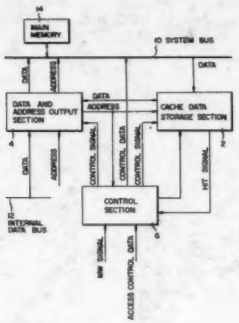
Tetsu Igarashi, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 15, 1986, Ser. No. 941,385

Claims priority, application Japan, Dec. 20, 1985, 60-286937

Int. Cl.[4] G06F *12/04*

U.S. Cl. 364—200 **9 Claims**



1. An apparatus for performing a partial write operation of at least one byte of partial write data to an address of a word in a main memory wherein data is stored in words of multiple bytes, comprising:

cache means for storing cache data in addressable words containing a plurality of bytes capable of being individually enabled for reading and writing, for determining in accordance with the main memory address whether the main memory address causes a cache hit, for selectively generating a cache hit signal in accordance with the determined result, for outputting at least one byte of cache data from a byte enabled for reading and designated by the main memory address in accordance with negation of a first control instruction input thereto, and for inputting and storing the partial write data at all bytes enabled for writing of a word at a cache address corresponding to the main memory address in accordance with said first control instruction;

address and data output means for receiving the main memory address and the partial write data, for outputting the main memory address to said cache means, for combining the outputted cache data and the partial write data in accordance with a second control instruction input thereto, and for outputting the partial write data to said cache means in accordance with said second control instruction such that said combining and said outputting the partial write data to cache are simultaneously performed; and

control means for selectively generating the first and second control instructions from the main memory address, for generating an input access control data indicating a byte width of the partial write data in accordance with the hit signal, and for outputting said first control instruction to said cache means wherein negation of said first control instruction enables at least one byte in a word of said cache means for reading, and wherein said first control instruction enables for all other bytes in said word for

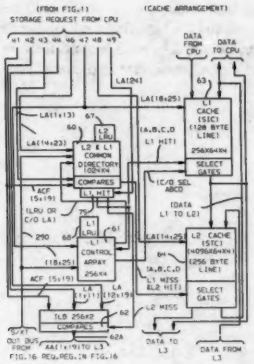
writing, and for outputting said second control instruction to said address and data output means.

4,797,814

VARIABLE ADDRESS MODE CACHE

James G. Brenza, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1986, Ser. No. 858,322
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **24 Claims**



1. A logical address private cache arrangement in a data processing system including a processor, a translation lookaside buffer (TLB) and a main storage, the processor being able to switch its mode of addressing between real and virtual in its requests for data units from main storage, the cache arrangement comprising:

a first cache accessible to the processor, the first cache having locations for containing a plurality of lines of data initially copied from main storage,

a cache directory having a plurality of directory entries, each cache directory entry including a logical address representation with an associated indicator of whether the representation is of a real/absolute address or is of a virtual address,

means providing to the cache directory each logical address (LA) requested by the processor with an indicator signal of whether the requested LA is a real/absolute address or a virtual address,

directory selecting means for receiving each logical address (LA) requested by the processor and selecting a set containing one or more potential hit entries in the cache directory,

cache hit determining means for examining each potential hit entry in the set by comparing the logical address (LA) and the indicator signal requested by the processor with a LA representation and the associated indicator in each valid entry in the set for a match condition in order to determine if any entry is a hit entry without using any address translation from the TLB.

4,797,815

INTERLEAVED SYNCHRONOUS BUS ACCESS PROTOCOL FOR A SHARED MEMORY MULTI-PROCESSOR SYSTEM

Wayne T. Moore, Safety Harbor, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Nov. 22, 1985, Ser. No. 800,995
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **1 Claim**

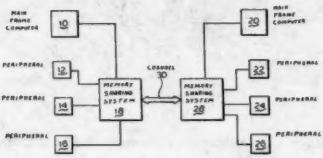
1. A method for providing asynchronous processors with inter-processor communication and access to several memory modules over a common bus which includes a first bus and a second bus, comprising:

providing clock pulses on said common bus, each pulse having a period;

asserting a request signal and placing priority signal on said common bus during a first period when any one of said processors performs an operation that requires access to the memory module;

polling the processors during said first period to determine whether the processors request access to said common bus and to determine which one processor has priority;

sending a destination address from said one processor to a destination during a second period, said destination being chosen from said processors and said several memory modules;



performing one of reading input data between said destination and said processor having priority during a reading input data period and writing output data between said processor having priority and said destination during a writing output data period, said reading period being separated from said second period by a plurality of idle periods during which a second processor accesses a second destination on said common bus;

multiplexing priority and reading input data signals on said first bus, and multiplexing address and writing output data signals on said second bus;

generating poll inhibit signals prior to each reading input data signal and prior to each memory address signal preceeding a writing output data operation; and

queuing said input data in a first-in-first-out manner for each of said processors when said input data indicates an interprocessor interrupt.

4,797,816

VIRTUAL MEMORY SUPPORTED PROCESSOR HAVING RESTORATION CIRCUIT FOR REGISTER RECOVERING

Kunio Uchiyama, Hachioji, and Tadahiko Nishimukai, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,231
Claims priority, application Japan, Jan. 28, 1985, 60-12394
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **8 Claims**

1. A processor for supporting a virtual memory system comprising:

a plurality of general-purpose registers for storing information;

a plurality of saving registers for saving information contained in at least one of said plurality of general-purpose registers during an addressing operation for said virtual memory system;

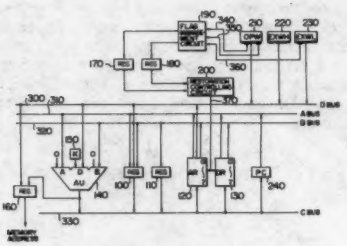
first bus means connected to an output of each of said plurality of general-purpose registers and to an input of each of said plurality of saving registers;

second bus means connected to an input of each of said plurality of general-purpose registers and to an output of each of said plurality of saving registers;

address calculation means, having an input connected to said first bus means and an output connected to said second bus means, for generating addresses to address said virtual

memory system in response to information which is received from said general-purpose registers and simultaneously saved in said saving registers;

flag register means for storing discriminating information indicating which of said plurality of general-purpose registers have information saved in said plurality of saving registers; and



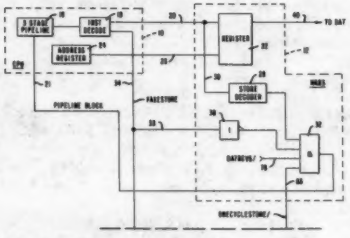
restoration controlling means connected to said flag register means and said general-purpose registers and responsive to a fault exception signal from said virtual memory system for re-storing at least that part of the information saved in said plurality of saving registers to a general-purpose register which is indicated by said discrimination information stored in said flag register means.

4,797,817

SINGLE CYCLE STORE OPERATIONS IN A VIRTUAL MEMORY

Chinh K. Nguyen, San Diego, and Charles A. Flicek, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1986, Ser. No. 940,315
Int. Cl.[4] G06F *9/00, 9/30, 9/38, 9/06*
U.S. Cl. 364—200 **7 Claims**



1. A device for performing memory stores in a memory of a computer system wherein virtual addresses must be translated to real addresses, said device comprising:

processor means having a pipeline for processing commands in multiple stages, said commands including a plurality of instructions, including store instructions, and virtual addresses, said pipeline being blocked by the store instructions;

first decode means connected to said processor means for generating a first signal in response to a decoding of a selected store instruction of selected commands in a first selected stage of said pipeline;

translation assist means including input means for receiving virtual addresses in the pipeline of said processor means, said translation assist means for generating a second signal if a virtual address in a second selected stage of said pipeline has been previously translated to a real address;

pipeline controlling means connected to said first decode means and said translation assist means, said pipeline controlling means for unblocking said pipeline in response to at least one of said first signal and said second signal; and

second decode means connected to said processor means for generating a third signal in response to a decoding of every store instruction from said processor means; and

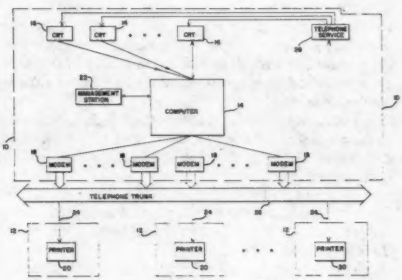
wherein said pipeline controlling means includes first logic means having a first input connected to said first decode means for receiving said first signal, a second input means connected to said translation assist means for receiving said second signal, and a third input connected to said second decode means for receiving said third signal, said first logic means for blocking said pipeline for every store instruction decoded by said second decode means except when said first decode means decodes said selected store instruction.

4,797,818

FOOD ORDER/DELIVERY SYSTEM

Jeffrey J. Cotter, Orlando, Fla., assignor to Jeno F. Paulucci, Sanford, Fla.

Filed Mar. 26, 1987, Ser. No. 30,878
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—401 **7 Claims**



1. A system for receiving orders for food at a central location and transmitting said orders to a preselected remote store for preparation of said food comprising:

means at said central location for storing market allocation data in the form of a software database;

means at said central location for receiving customer order data;

means at said central location for automatically comparing said customer order data with said market allocation data and for automatically selecting a particular store to receive said order data on the basis of said comparison;

means at said central location responsive to said means for comparing and selecting for automatically transmitting said order data to said selected store; and

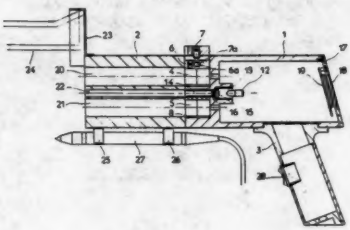
means at said selected store for automatically receiving and displaying said order data.

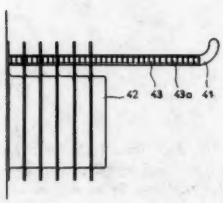
4,797,819

SYSTEM FOR DETERMINING REPLENISHMENT NEEDS ON A PRODUCT DISPLAY BY MEASURING VACANT SPACE

Jean-Pierre Dechirot, Balan, France, assignor to Societe Vynex SA, France

PCT No. PCT/FR85/00232, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01386, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 28, 1985, Ser. No. 866,490
Claims priority, application France, Aug. 31, 1984, 84 13598
Int. Cl.[4] G06F 15/24; G06M 9/00; G01D 5/28; G01S 15/08
U.S. Cl. 364—403 28 Claims





1. A system for the automatic determination of the quantity of product units required to replenish the inventory on a sales display including a plurality of pegs projecting therefrom, each of said plurality of pegs including a first end mounted to a display surface and a second end projecting therefrom, whereby each of said plurality of pegs can carry a predetermined maximum number of said product units thereon and said quantity of product units required to replenish the inventory of each of said plurality of pegs is a function of the distance between said second ends of said plurality of pegs and the remaining plurality of said product units on each of said plurality of pegs, said system comprising marking indicia applied along substantially the entire length of each of said plurality of pegs, portable marking indicia reading means for reading said marking indicia so as to determine said distance between said second ends of said plurality of pegs and said remaining plurality of said product units on each of said plurality of pegs, and microcomputer means connected to said portable marking indicia reading means for automatically converting said determined distance into said quantity of product units by using product parameter data associated with said product units required to replenish the inventory on each of said plurality of pegs.

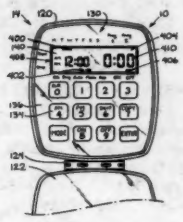
3. The system according to claim 1 wherein said marking indicia comprises bar markings and said portable marking indicia reading means comprises a pencil-type reader.

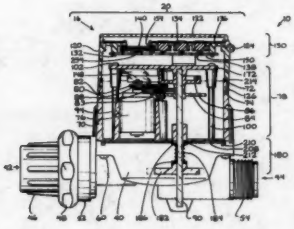
4,797,820

PROGRAMMABLE FLOW CONTROL VALVE UNIT WITH CLOCK, PROGRAM, AUTOMATIC, MANUAL, AND REPEAT MODES

Dennis A. Wilson, Wauconda Township, Lake County; Dennis W. Ansel, Rolling Meadows, and Mark S. Williamsen, Evanston, all of Ill., assignors to Ansan Industries Limited, Harwood Heights, Ill.

Filed Jul. 28, 1986, Ser. No. 890,170
Int. Cl.[4] G05D 7/06
U.S. Cl. 364—420 20 Claims





1. A programmable flow control valve unit for directing the flow of a fluid, said valve unit including a valve assembly operably connected to an electronic assembly, wherein:

a. said electronic assembly includes a sequence type control with a programmable memory means operably connected to a means for accepting cycle selections by a user of said programmable flow control valve unit;

b. said sequence type control includes a selected program for activating said electronic assembly and thereby operate said valve assembly;

c. said selected program includes at least one discrete program advancing operation;

d. said discrete program advancing operation is dependent, at least in part, upon said cycle selections;

e. said electronic assembly further includes a copying means for duplicating said discrete program advancing operation to permit said selected program to have easily duplicated parts;

f. said electronic assembly further includes a display means operably interconnected with said electronic assembly for providing an indication of instructions given to said programmable flow control valve unit;

g. said electronic assembly further includes a clock means operably interconnected with said electronic assembly for timing said operations; and

h. said electronic assembly further includes a control logic means operable during a programmable mode operably

connected to said electronic assembly in order to enable the electronic assembly to function;

i. said sequence-type control is a push button assembly operably connected to said discrete program advancing operation for setting a set of five modes including a clock mode, a program mode, an automatic mode, a manual mode, and a repeat mode;

j. an enter means is operably connected for loading each of said five modes within said discrete program advancing operation;

k. said clock mode provides a day readout and a time of day readout within said display means; and

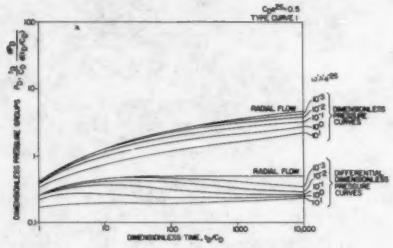
l. said display means provides a program readout for said discrete program advancing operation and a clock mode readout for said clock mode at the same time.

4,797,821

METHOD OF ANALYZING NATURALLY FRACTURED RESERVOIRS

Kevin R. Petak, Duncan; Mohamed Y. Soliman, Lawton, and Merlin F. Anderson, Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 2, 1987, Ser. No. 34,441
Int. Cl.[4] E21B *49/00, 47/00*
U.S. Cl. 364—422 **22 Claims**



1. A method of determining characteristics of an underground reservoir formation having a well communicating therewith comprising the steps of:

obtaining a theoretical solution representing the variation of dimensionless wellbore pressure during an early time radial flow period and a transition flow period in the underground reservoir as a function of (a) the ratio of dimensionless time to dimensionless wellbore storage coefficient, t_D/C_D, (b) a first parameter C_De^{2S}, and (c) a second parameter $\omega'\lambda'e^{-2S}$, the theoretical solution being based on the early time radial flow period and the transition period flow of a dual porosity isotropic uniform thickness reservoir exhibiting wellbore storage and skin effects;

varying, at a predetermined time, a flow area of a valve passage through whioh fluid from a wellbore flows;

detecting and recording a variation of wellbore pressure at the underground reservoir formation as a function of time measured from the variation of wellbore flow area to thereby obtain an experimental data variation;

comparing the experimental data variation to the theoretical solution to determine which values of the first parameter and the second parameter correspond to the experimental data variation;

selecting a match point on the experimental data variation and the corresponding theoretical surface;

using the selected match point and the dimensionless time corresponding to the end of the transition period to determine at least one of the following characteristics of the underground formation:

flow capacity, kh,

effective permeability, k,

transmissibility, kh/μ'

wellbore storage constant, C,

dimensionless wellbore storage coefficient, C_D,

dimensionless fracture transfer coefficient, λ or λ', and

dimensionless storativity ratio, ω or ω'; and

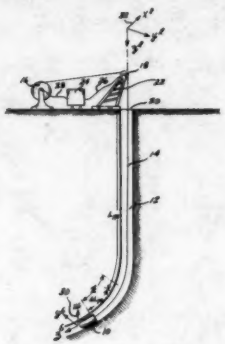
recording the detected variation of wellbore pressure and the at least one determined characteristic of the underground formation.

4,797,822

APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A TOOL IN A BOREHOLE

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 31, 1986, Ser. No. 948,323
Int. Cl.[4] G01V *3/18*; E21B *47/00*
U.S. Cl. 364—422 **32 Claims**



1. A method for determining the path length between a borehole entrance opening and a probe that is suspended to move through the borehole by an elastic cable, said method comprising:

(a) generating a cable feed rate signal representative of the current rate at which said cable is moving past said entrance opening of said borehole;

(b) generating a cable feed rate correction signal representative of current changes in the length of said cable that are induced by temperature and inclination of the portion of said borehole that surrounds said probe;

(c) combining said cable feed rate signal and said cable feed rate correction signal to provide a compensated cable feed rate signal;

(d) generating a probe velocity signal representing the current rate at which said probe is moving along said borehole;

(e) detecting whether the magnitude of the difference between said probe velocity signal and said compensated feed rate signal exceeds a predetermined value;

(f) selecting said compensated feed rate signal when said magnitude of the difference between said probe velocity signal and said compensated cable feed rate does not exceed said predetermined value;

(g) selecting said probe velocity signal when said magnitude of the difference between said probe velocity signal and said compensated feed rate signal exceeds said predetermined value;

(h) periodically repeating steps (a) through (g); and,

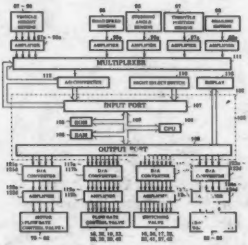
(i) determining the integral with respect to time of the selected one of said probe velocity signal and said compensated cable feed rate signal as said steps (a) through (g) are periodically repeated.

4,797,823

SYSTEM FOR VEHICLE BODY ROLL CONTROL PERFORMING SUSPENSION HARDNESS CONTROL

Hiroyuki Ikemoto; Nobutaka Oowa, both of Toyota; Yasutaka Hayashi, and Shunichi Doi, both of Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyota Central Research & Development Laboratories, Inc., both of Aichi, Japan

Filed Oct. 21, 1986, Ser. No. 921,138
Claims priority, application Japan, Oct. 22, 1985, 60-235662; Oct. 22, 1985, 60-235663
Int. Cl.[4] B60G *17/00*
U.S. Cl. 364—424.05 28 Claims



1. For a vehicle comprising a body and a plurality of wheels upon which it runs, a vehicle roll control system of vehicle height adjustment type, comprising:

a plurality of suspension means, one corresponding to each one of said vehicle wheels, for resiliently suspending said vehicle wheels from the vehicle body and being controllable to vary the hardness/softness characteristic of suspension of said vehicle wheels between at least two different hardness/softness characteristic levels including a harder characteristic level and a softer characteristic level, each said suspension means comprising an actuator assembly which has a pressure chamber and being adapted to increase or decrease the suspension height of its corresponding vehicle wheel as a result of the supplying or discharging of working fluid to or from said pressure chamber;

a plurality of working fluid supplying and discharging means, one corresponding to each said actuator assembly, which serve to supply working fluid to each said pressure chamber and to discharge working fluid from each said pressure chamber;

vehicle speed detecting means for sensing the road speed of the vehicle;

steering angle detecting means for sensing the steering angle of the vehicle;

means for sensing the actual roll angle ϕ_f of said vehicle body; and

means for computing and control, which computes a steady state roll angle ϕ_∞ of the vehicle body from the vehicle speed sensed by said vehicle speed detecting means and the steering angle sensed by said steering angle detecting means, advances the phase of a signal indicative of said steady state roll angle ϕ_∞ to thereby compute a compensating value ϕ_{∞}, and then computes a difference value ϕ based upon a desired roll angle ϕ_a of the vehicle body, said compensating value ϕ_{∞}, and said actual vehicle body roll angle ϕ_f, according to the equation:

$$\phi=\phi_a-(k_1\phi_\infty+k_2\phi_f)$$

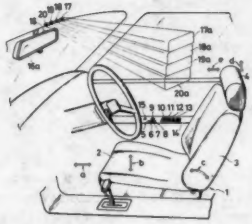
where k_1 and k_2 are positive constants; said computing and control means being adapted to control said plurality of working fluid supplying and discharging means based upon said difference value ϕ when the absolute value of said difference value ϕ is larger than a first predetermined value ϕ_1, and to control the hardness/softness characteristics of said plurality of vehicle wheels suspension means according to the absolute value of said difference value ϕ when the absolute value of said difference value ϕ is smaller than said first predetermined value ϕ_1.

4,797,824

AUTOMATIC HEADREST POSITIONING APPARATUS FOR SEAT OF MOTOR VEHICLES

Hiroshi Sugiyama, Hiratsuka; Mikio Fujiwara, and Chikamasa Ikeda, both of Yokohama, all of Japan, assignors to Ikeda Bussan Co. Ltd., Kanagawa, Japan

Continuation of Ser. No. 696,423, Jan. 30, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,522
Claims priority, application Japan, Jan. 31, 1984, 59-15431
Int. Cl.[4] G06F *15/20;* B60N *1/02*
U.S. Cl. 364—424.05 10 Claims



6. An automatic headrest positioning apparatus, comprising:

a headrest provided on a seat which can be displaced by seat displacing means, said headrest being displaceable by headrest displacing means;

seat position detecting means for detecting the displacements of a seat cushion in up-down and in forward-rearward directions, and an inclination of a seat back;

eye position detecting means including light beam projecting means which project a plurality of different colors of light beam for detecitng the position of the eye of a sitter on said seat;

memory means for storing seat position data obtained through said seat position detecting means and detected eye position data obtained through said eye position detecting means; and

control means for performing arithmetic operation on the selected seat position data and the detected eye position data read out from said memory means to thereby cause said headrest to be displaced to an optimal position by driving the headrest displacing means on the basis of the result of said arithmetic operation.

4,797,825

ANTI-SKID CONTROL SYSTEM FOR MOTOR VEHICLES

Haruki Shimanuki, Kasukabe; Katsuya Miyake, Ageo; Hideo Akima, Yokohama, and Akira Hoashi, Munakata, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

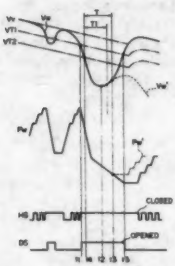
Filed Dec. 29, 1986, Ser. No. 946,824
Claims priority, application Japan, Dec. 27, 1985, 60-292994
Int. Cl.[4] B60T *8/58*
U.S. Cl. 364—426.02 4 Claims

1. An anti-skid control system for a motor vehicle, having a plurality of wheels and in which wheel velocity of the wheels is decreased by increasing brake pressure and is increased by reducing the brake pressure, and in which the reduction of the brake pressure is to be stopped at a point where a level of the wheel velocity is reached which is higher than a low peak of the wheel velocity by a predetermined percentage of difference between the wheel velocity at time when reduction of the

brake pressure is started, and the low peak of the wheel velocity, comprising:

means for providing a computed vehicle velocity on the basis of the highest one of the wheel velocities of the motor vehicle;

means for providing a first reference velocity and a second reference velocity, each of said reference velocities being lower than said computed vehicle velocity, said first and second reference velocities respectively having a first and



a second velocity different, or a first and a second velocity ratio, with respect to said computed vehicle velocity; said first reference velocity being higher than said second reference velocity; and

means for continuing reducing the brake pressure beyond said point until the wheel velocity recovers up to said first reference velocity, if the time period from when the wheel velocity reaches said second reference velocity to said point where said level of the wheel velocity is reached, is longer than a predetermined time period.

4,797,826

SPEED CONTROL SYSTEM FOR VEHICLES

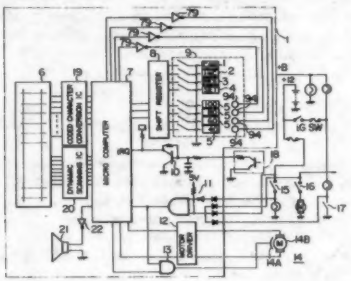
Nobuyoshi Onogi; Mamoru Shimamoto, both of Nagoya, and Yoshio Shinoda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1985, Ser. No. 737,657

Claims priority, application Japan, May 31, 1984, 59-112297

Int. Cl.⁴ B60K *31/04*

U.S. Cl. 364—426.04 **7 Claims**



1. A speed control system for a vehicle comprising:

preset means for selecting and presetting a desired running speed of a vehicle;

means for determining an actual running speed of said vehicle;

means for defining a lower limit running speed which is smaller than said desired running speed by a predetermined value and for defining an upper limit running speed which is larger than said desired running speed by said predetermined value;

means for comparing said actual running speed of said vehicle with said upper and lower limit running speeds;

means for permitting a control of the vehicle speed in accordance with said desired running speed only when said actual running speed is greater than said lower limit running speed and is less than said upper limit running speed; and

controlling means, responsive to said permitting means for controlling a vehicle speed to approach said desired running speed only when said permitting means permits said control.

4,797,827

ANGULAR POSITION DETECTOR

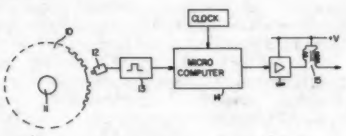
Kevin Cockerham, Birmingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation of Ser. No. 625,893, Jun. 29, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,778

Claims priority, application United Kingdom, Jul. 2, 1983, 8318008

Int. Cl.⁴ F02P *5/03*; H03K *13/02*

U.S. Cl. 364—431.03 **5 Claims**



1. An angular position detector, comprising:

a toothed wheel having a plurality of teeth, each one of said plurality of teeth being spaced apart from at least one adjacent tooth by a first predetermined angular spacing;

a gap between two adjacent teeth of said toothed wheel, said gap having a second predetermined angular spacing which is greater than said first predetermined angular spacing;

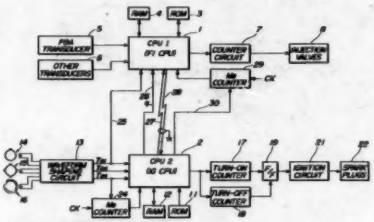
a sensing means for sensing the teeth of said toothed wheel, said sensing means being provided adjacent said toothed wheel, for producing an output signal in the form of a pulse train as individual ones of said plurality of teeth pass by said sensing means;

a discriminating means for discriminating the passing of said gap past said sensing means, said discriminating means receiving said output signal from said sensing means, said discriminating means including a datum signal generating means for generating a datum signal and a measurement means for measuring interpulse time intervals between successive pulses of said pulse train of said sensing means output signal, said discriminating means triggering said datum signal generating means for producing a datum signal in response to said gap passing by said sensing means, said discriminating means discriminating passage of said gap past said sensing means by comparing the current interpulse interval to the next preceding interpulse interval and triggering said datum signal generating means to generate a datum signal when the current interpulse interval is significantly shorter than the next preceding interpulse interval.

4,797,828
ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yoshio Suzuki, Wakoh, and Suzuki Yukihiko, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1986, Ser. No. 840,584
Claims priority, application Japan, Mar. 18, 1985, 60-052506
Int. Cl.[4] F02M *51/00*
U.S. Cl. 364—431.04 **5 Claims**

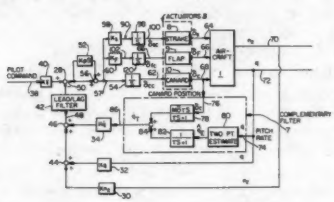


1. An electronic control system for an internal combustion engine, comprising:
- at least two central processing units for executing control of different operations;
- at least two counters connected to respective ones of said central processing units for individually detecting engine speed;
- means connected to said counters and operable when the engine is in a predetermined operating state, wherein the engine operation is steady, for inputting clock pulses to each of said counters at a predetermined time interval whereby said each counter counts said clock pulses to thereby detect engine speed in said predetermined operating state of the engine;
- memory means storing values representative of normal engine speed in said predetermined operating state as counted values of said counters;
- means for sensing a malfunction in each of said counters by comparing a counted value recorded by a counter and a respective stored value stored in said memory device; and
- means for enabling each of the operations to be controlled based on an output from one of said counters when it is sensed that the other of said counters malfunctions.

4,797,829
FLIGHT CONTROL OPTIMIZATION SYSTEM FOR MULTI-CONTROL SURFACE AIRCRAFT

Romeo P. Martorella, Dix Hills, and Jimmie Chin, Flushing, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,454
Int. Cl.[4] G05B *11/42*
U.S. Cl. 364—434 **10 Claims**

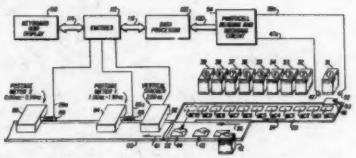


1. In a flight control system for an aircraft having three control surfaces, interconnected feedback control loops for stabilizing and optimizing the performance of the aircraft, the stabilizing loop comprising:
- first means for summing signals representing pitch rate and vertical acceleration of the aircraft;
- complementary filter means connected at its input to the pitch rate signal and a canard position signal for filtering these signals together to form a combined signal thereby reducing signal noise;
- second means for summing the combined signal and an output signal from the first summing means;
- filter means connected at its input to the output of the second summing means for providing lead compensation of the signal resulting at the output of the second summing means thus providing a lead compensated signal;
- means for obtaining an error signal between the lead compensated signal and a pilot command input signal; and
- parallel means distributing the error signal as respective stabilization error signals for the three controlled surfaces;
- means for integrating the stabilization error signal; and
- means for connecting the stabilization error signals to actuators of corresponding control surfaces.

4,797,830
INSERTION MACHINE WITH POSTAGE CATEGORIZATION AND SELECTIVE MERCHANDISING

Brad A. Baggarly, Upland, Calif., and Christopher K. Scullion, Bethlehem, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 818,389, Jan. 13, 1986, Pat. No. 4,639,873, which is a continuation of Ser. No. 576,839, Feb. 3, 1984, abandoned. This application Jan. 27, 1987, Ser. No. 6,853
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[4] B65H *39/075*; B65B *35/50*; G06F *15/20*
U.S. Cl. 364—464.03 **22 Claims**



1. An insertion machine of the type in which a plurality of feed stations feed items onto an insertion track, said plurality of feed stations including a control feed station from which a master control item is fed onto said track and further feed stations from which items are selectively fed in accordance with indicia on said master control item onto said track for inclusion with a group including said master control item, wherein the improvement comprises:
- means for reading said indicia;
- means for designating at least one of said feed stations as a required feed station from which items must be fed if said indicia so indicates or an optional feed station from which items may conditionally be fed;
- means for determining from said indicia on said master control item the particular further feed stations from which items must be fed onto said insertion track for inclusion with said group including said master control item;
- data processing means including memory means and arithmetic logic means;
- means including said data processing arithmetic logic means for using values indicative of the per item weight of items held in said control feed station and said required feed stations from which it is required that items be fed to obtain a calculated total weight with respect to said group of items;

means for using said calculated total weight to determine a postage category for said group of items;

means for determining whether optional items from one or more respective optional feed stations can be fed from said optional feed stations and associated with said group of items without changing the postage category determined on the basis of the calculated total weight of said group of items; and,

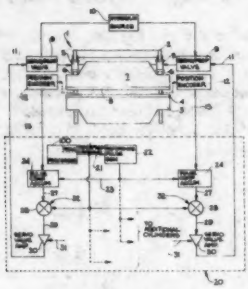
means for selectively enabling one or more optional feed stations to feed items for inclusion with a group of items in accordance with said determination of whether said optional items can be fed without changing the postage category of said group of items.

4,797,831

APPARATUS FOR SYNCHRONIZING CYLINDER POSITION IN A MULTIPLE CYLINDER HYDRAULIC PRESS BRAKE

Paul A. Dressing, Cincinnati, Ohio, and John L. Macdonald, Aurora, Ind., assignors to Cincinnati Incorporated, Cincinnati, Ohio

Filed Nov. 18, 1986, Ser. No. 932,107
Int. Cl.[4] G06F *15/46;* B21D *5/02*
U.S. Cl. 364—474.07 **22 Claims**



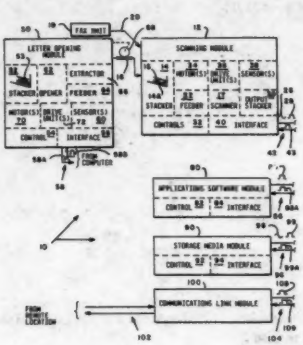
1. In a press brake having a bed supporting a forming die, a vertically movable ram mounting a punch for cooperating with the die to bend a workpiece positioned on said die, at least two pistons connected to said ram at horizontally spaced locations, a hydraulically operated cylinder associated with each of said pistons for vertically moving said ram, and flow control means associated with each of said cylinders and responsive to an electrical command signal for its respective cylinder to control the flow of hydraulic fluid to and from its respective cylinder, the improvement comprising a ram position encoder is association with each of said cylinders each producing a digital pulse for each increment of vertical ram travel in the form of a ram position signal, control means for generating said command signal for each of said flow control means, said control means including programmed means for generating an electrical speed signal representative of the desired speed of the ram, said control means including means to produce a digital re ference signal proportional to the desired speed of said ram, and means to compare said ram position signals to said digital reference signal and to produce an error signal for each flow control means, and means to sum each error signal with said speed signal to produce said command signal for each of said flow control means whereby to control the speed of said ram and to control the vertical position of all parts of said ram during vertical movement thereof at least just before and during ram reversal.

4,797,832

LETTER PREPARING APPARATUS

Barry H. Axelrod, Newtown; Robert T. Durst, Jr., Monroe; Kevin D. Hunter, Stratford, and Alfred C. Schmidt, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 13, 1987, Ser. No. 25,307
Int. Cl.[4] G06F *15/20;* B65H *39/02*
U.S. Cl. 364—478 **41 Claims**



1. Apparatus for preparing a letter, comprising:

a. printing means;

b. means for supplying a stationery item; and

c. computer means, said computer means including means for receiving a signal representative of letter data corresponding to information having a format, said information including a plurality of parts, said computer means including means programmed for reformatting said letter data, said reformatted letter data including a plurality of parts, each of said information parts corresponding to a different one of said data parts, said computer means including means programmed for selecting at least one of said data parts, said computer means including means for causing said supplying means to supply said stationery item, and said computer means including means for causing said printing means to print on said stationery item the information part corresponding to the selected data part.

4,797,833

MICROPROCESSOR BASED CONTROLLER FOR A THREE PHASE BRIDGE RECTIFIER

Ahmed El-Amawy, and Ali Mirbod, both of Baton Rouge, La., assignors to Louisiana State University, Baton Rouge, La.

Filed Sep. 30, 1986, Ser. No. 913,765
Int. Cl.[4] H02M *7/155;* H02P *13/26*
U.S. Cl. 364—483 **8 Claims**

1. A method of controlling a six pulse bridge phase controlled rectifier using a microprocessor comprising the steps of:

(a) synchronizing an oscillator to a frequency of an ac power source wherein said oscillator frequency is a multiple of said power source frequency;

(b) driving a first counter with said oscillator;

(c) driving a second counter with said oscillator;

(d) executing a delay angle match routine for a value of said second counter, said match routine comprising:

(i) determining a cosine of α wherein α is a delay angle corresponding to said value of said second counter;

(ii) reading a desired output voltage;

(iii) determining whether said output voltage is greater than or equal to cosine α minus an inductance factor;

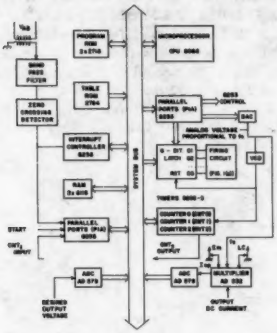
(iv) repeating said match routine for a successive value of said second counter;

(e) exiting said match routine when said output voltage is

greater than or equal to cosine α minus said inductance factor, and advancing a gating pattern of said rectifier;

(f) calculating a reload value of said second counter based upon a solution value of α when said gating pattern was advanced, whereby a number of counts of said second counter from said reload value to a value corresponding to said solution value of α projects a subsequent gating pattern advancement in 60° of said power source's cycle;

(g) reloading said second counter with said reload value;



(h) determining whether a zero crossing has occurred, an occurrence of which indicates a value of said first counter has been read and said first counter has been reset;

(i) if said zero crossing has occurred, comparing said value of said first counter to a previous value of said counter to determine if said first counter needs to be synchronized to said power source frequency;

(j) if said first counter needs to be synchronized, adjusting said oscillator frequency via a phase locked loop subroutine; and

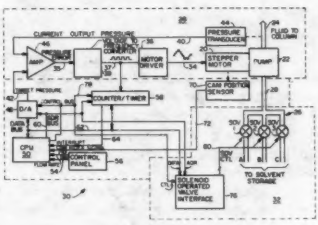
(k) resuming said match routine.

4,797,834

PROCESS FOR CONTROLLING A PUMP TO ACCOUNT FOR COMPRESSIBILITY OF LIQUIDS IN OBTAINING STEADY FLOW

Ronald E. Honganen, 600 Marathon Dr., Campbell, Calif. 95008; Robert L. Howe, 273 Marsh Dr., San Ramon, Calif. 98543, and Leslie A. Miller, 4150 Piper Dr., San Jose, Calif. 95117

Filed Sep. 30, 1986, Ser. No. 913,709
Int. Cl.[4] G06F *15/46*; F17D *3/00*
U.S. Cl. 364—510 **9 Claims**



8. A method of controlling a pumping system for a liquid chromatography system having a pump having at least two pistons which pump liquid in a pump cycle, and having solvent intake valves coupling a plurality of solvent reservoirs for solvents of different types to an input of said pump, comprising the steps of:

receiving user data regarding a selected flow rate and a selected solvent composition;

generating control signals for controlling said pump to obtain said selected flow rate and controlling said solvent intake valves for said pumping system to obtain the selected solvent composition;

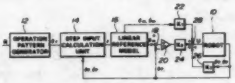
calculating a compressibility correction factor of the selected solvent composition at the selected flow rate using measurable times for movements of said pistons through selected portions of said pump cycle for compressible and incompressible liquids and correcting the control signals for said pump and said solvent intake valves to maintain said selected flow rate and said selected solvent composition over changing conditions of compressibility.

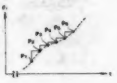
4,797,835

MODEL FOLLOWER CONTROL APPARATUS

Kunihiko Kurami, and Kiyoshi Akutagawa, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 16, 1987, Ser. No. 133,686
Claims priority, application Japan, Dec. 16, 1986, 61-297770; Jan. 9, 1987, 62-1868
Int. Cl.[4] G05B *13/00*
U.S. Cl. 364—513 **7 Claims**





1. An apparatus for model follower control of a robot, comprising:

sensor means sensitive to existing robot conditions for producing existing robot condition data representing the sensed robot conditions;

a source for generating target position data representing a target position for the robot;

means responsive to the target position data for calculating target angular position data representing target angular positions of the robot for respective control periods;

means responsive to the target angular position data and the existing robot condition data for calculating step input data from a first relationship programmed therein;

means responsive to the step input data for calculating command data from a second relationship programmed therein, the second relationship being represented by a discrete equation; and

means responsive to the command data and the existing robot condition data for controlling the robot to permit continuous path operation of the robot;

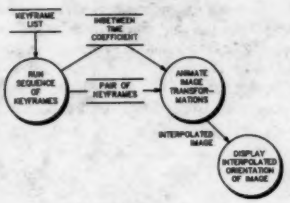
the first relationship being represented by an equation derived from the discrete equation used in calculating command data for a control period after a predetermined number of control periods.

4,797,836

IMAGE ORIENTATION AND ANIMATION USING QUATERNIONS

Francis A. Witek, Cedar Ridge, and David E. Lake, Jr., Penn Valley, both of Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Nov. 19, 1986, Ser. No. 932,805
Int. Cl.[4] G06F *15/66*; G09G *1/16*
U.S. Cl. 364—518 **21 Claims**



1. In a television video effects device of the type that transforms an input video image to provide motion of the input video image on a display a method for orientating and animating video images comprising the steps of:

inputting new orientation parameters for the input video image, the input video image having a current orientation quaternion;

converting the new orientation parameters into a new orientation quaternion for the input video image on a field by field basis; and

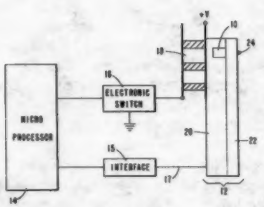
transforming the new orientation quaterion into a transformation matrix for combination with the input video image to display the input video image in the new orientation.

4,797,837

METHOD AND APPARATUS FOR THERMAL PRINTER TEMPERATURE CONTROL

Ralf M. Brooks, Waterloo, Canada, assignor to NCR Canada Ltd. - NCR Canada LTEE, Mississauga, Canada

Filed Apr. 24, 1986, Ser. No. 855,271
Int. Cl.[4] G01D *15/10*
U.S. Cl. 364—519 **22 Claims**



8. Thermal printing apparatus comprising, in combination:

thermal print head means including a ceramic layer and a plurality of resistive elements thereon and capable, when heated to a sufficient degree, of producing markings on a record member;

a heat sink in contact with said thermal print head means;

a thermal print head frame located in proximity to said heat sink;

sensing means located in said heat sink for measuring the temperature of the thermal print heat means;

cooling means positioned in an aperture in said thermal print head frame in contact with said heat sink, and capable of cooling said thermal print head means;

means for periodically comparing the temperature of the sensing means with a reference temperature; and

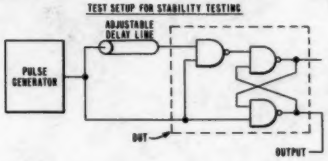
means for operating said cooling means when the measured temperature exceeds the reference temperature, and for terminating the operation of said cooling means when the measured temperature is reduced to the reference temperature or below.

4,797,838

PROCEDURE FOR EVALUATING THE METASTABILITY CHARACTERISTICS OF A SYNCHRONIZING DEVICE

Hilding E. Nelson, Scandia; Jeffrey O. Brown, St. Paul, and Shayne M. Zurn, Blaine, all of Minn., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 16, 1987, Ser. No. 120,903
Int. Cl.[4] G01D *21/00*; G06F *11/00*; H03K *11/16*
U.S. Cl. 364—551.01 **4 Claims**



1. A method for evaluating the metastability characteristics of a synchronizing device having a latching stage, comprising the steps of:

verifying a stable response of the latching stage in the region of the metastable operating point;

verifying that the closed loop gain of the latching stage is greater than one in the region of the metastable operating point; and

estimating of the meantime between failure to resolve from a combination of values relating to the effective gain (A) of the latching stage, the effective time delay (TP) through the latching stage, the time allowed for the latching stage to resolve (Trc), the rise time of a clock signal (Tr), the frequency of the clock signal (Fc) and the frequency of the data signal (Fd).

4,797,839

RESOURCE ALLOCATION SYSTEM AND METHOD

John H. Powell, Preston, England, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 639,429, Aug. 10, 1984, abandoned. This application Jan. 12, 1987, Ser. No. 4,853
Claims priority, application United Kingdom, Aug. 13, 1983, 8321869
Int. Cl.[4] G06F *15/20, 15/36*
U.S. Cl. 364—554 **18 Claims**

1. A resource allocation system for optimally allocating a physical source among a series of demands on said physical resource, said system comprising:

resource allocation computing means having memory means, said resource allocation computing means:

(i) determining demand success probability data for each demand,

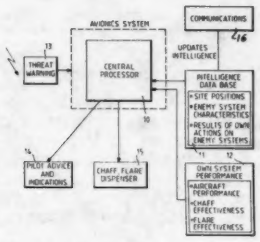
(ii) combining the demand success probability data of two of said demands, thereby to determine the optimum success probability data for the two demands combined and the optimum distribution data for the two demands combined,

(iii) storing the optimum success probability data and the optimum distribution data in said memory means,

(iv) selecting the demand success probability data relating to further demands in turn and processing this data, together with the optimum success probability data for the previ-

ous combination of demands previously determined, to determine updated optimum success probability data for the further demand and the previous combination and to determine the optimum distribution data for the further demand and the previous combination, and

(v) repeating said selecting and processing so as to process the data for the remaining demands and so as to determine



for a given amount of said physical resource the optimum allocation of the physical resource among the demands together with the resultant probability of successfully overcoming the demands, and

means connected to said resource allocation computing means for physically indicating how the physical resource should be optimally allocated in response to said demands.

4,797,840

INFRARED ELECTRONIC THERMOMETER AND METHOD FOR MEASURING TEMPERATURE

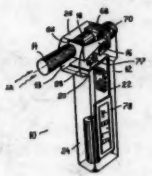
Jacob Fraden, Hamden, Conn., assignor to Thermoscan Inc., Tucker, Ga.

PCT No. PCT/US86/00782, § 371 Date Jan. 20, 1987, § 102(e) Date Jan. 20, 1987, PCT Pub. No. WO86/06163, PCT Pub. Date Oct. 23, 1986

Continuation-in-part of Ser. No. 724,339, Apr. 17, 1985, abandoned. This PCT application Apr. 15, 1986, Ser. No. 9,181

Int. Cl.[4] G01J 5/18; G01K 3/10

U.S. Cl. 364—557 **41 Claims**



1. A thermometer comprising:

a housing;

a sensor carried by said housing and responsive to infrared radiation for generating an electrical signal which exhibits a transient response upon initial receipt of said radiation;

means, carried by said housing, in optical alignment with said sensor, for directing infrared radiation from an object, the actual temperature of which is to be measured, to impinge upon said sensor;

means, carried by said housing, for enabling response of said sensor to said radiation;

and electrical means carried by said housing and responsive essentially only to said transient response of said signal for processing said signal to develop an indication of the actual temperature of said object.

4,797,841

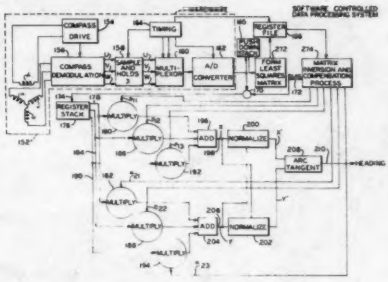
METHOD AND APPARATUS FOR AUTOMATIC CALIBRATION OF MAGNETIC COMPASS

Ronald R. Hatch, Wilmington, Calif., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 555,885, Nov. 28, 1983, Pat. No. 4,611,293. This application Jul. 2, 1986, Ser. No. 881,441

Int. Cl.[4] G06F 15/31; G01C 17/38

U.S. Cl. 364—571.04 **21 Claims**



1. Apparatus for calibrating the distortions in the readings of a magnetic compass having a plurality of windings in a two dimensional plane and mounted in a vehicle comprising:

first means coupled to the compass windings for obtaining the outputs from each of the windings as a function of time by weighting and combining the outputs from each of the windings at a first time and for a predetermined number of the next previous times to said first time to obtain a time filtered output for each of the windings;

second means coupled to said first means to form from said windings outputs measurement parameters having sensitivity values; said sensitivity values being variables in a generalized equation that represents the configuration and location of a geometrical figure defined by the locus of coordinates of said outputs, said outputs having distortions due to permanent and induced magnetism of the vehicle and distortions due to winding imbalance between the misorientation of the magnetic compass windings;

said second means for defining calibration coefficients of said measurement parameters in said equation;

third means coupled to said second means to incorporate said measurement parameters and said calibration coefficients into a least squares matrix and to solve for said calibration coefficients;

fourth means coupled to said third means for computing calibration parameters from said calibration coefficients that are to be applied to said outputs;

fifth means coupled to said first means and said fourth means for applying said calibration parameters to said outputs from said first means to form an output from each of two windings; said two windings being orthogonally related to one another;

sixth means coupled to said fifth means for obtaining the calibrated compass heading from said two windings outputs.

4,797,842

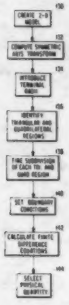
METHOD OF GENERATING FINITE ELEMENTS USING THE SYMMETRIC AXIS TRANSFORM

Lee R. Nackman, White Plains, and Vijay Srinivasan, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 717,368, Mar. 28, 1985, abandoned. This application Sep. 16, 1987, Ser. No. 97,382

Int. Cl.[4] G06F *15/60, 15/62, 15/328*

U.S. Cl. 364—578 19 Claims



1. A method for generating finite elements of an object defined by a geometric model and predicting a physical quantity of said object, comprising the steps of:

a first step of providing an object defined by a geometric model of a predetermined physical medium, wherein said first step includes inputting into a computer system said geometric model, said computer system including an image display screen displaying said geometric model;

a second step of transforming, using a symmetric axis transform, the object defined by said geometric model into a plurality of sub-objects, each defined by the symmetric axes of said symmetric axis transform, said geometric model and linkages from branches or terminators of said axes to said geometric model;

a third step of transforming each sub-object into finite elements, using said symmetric axes and radius functions of said axes;

calculating a finite difference equation for said finite elements; and

predicting a physical quantity of a physical phenomenon in said physical medium from said calculated finite difference equation.

4,797,843

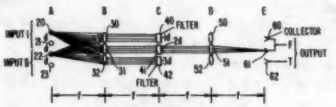
PARALLEL OPTICAL ARITHMETIC/LOGIC UNIT

R. A. Falk, Renton, and C. D. Capps, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1987, Ser. No. 19,767

Int. Cl.[4] G06F *7/56*

U.S. Cl. 364—713 20 Claims



1. A method of performing parallel logic or arithmetic operations comprising the steps of:

(a) providing at least two channels of coherent light sources, all channels being arranged in a parallel fashion with each other and each channel having a plurality of coherent light sources aligned with one another at inputs to the channels;

(b) turning on one of the plurality of light sources in each channel whereby a specific spatial pattern is formed;

(c) inputting the specific spatial pattern to an optical system having a plurality of channels, each channel of the optical system having only a plurality of linear optical elements;

(d) passing light from the specific spatial pattern primarily through only one channel of the optical system, and

(e) detecting the light that was passed through the one channel of the optical system and, thereby, recognizing the specific spatial pattern.

4,797,844

DIGITAL MIXING APPARATUS WHICH ATTENUATES THE SUM FREQUENCY OF THE MIXED SIGNALS

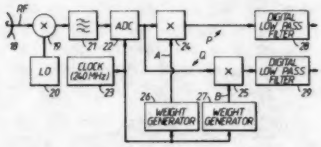
Michael C. Jackson, Chelmsford, United Kingdom, assignor to The General Electric Company, p.l.c., London, England

Filed Jun. 5, 1986, Ser. No. 870,890

Claims priority, application United Kingdom, Jun. 6, 1985, 8514260

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.01 10 Claims



1. Digital mixing apparatus comprising:

means, responsive to a variable input signal and a predetermined input signal, for mixing the input signals and for providing a mixed output signal in digital form, each input signal representing a respective frequency and the mixed output signal representing sum and difference frequencies of the input signals, and a digital filter for removing the sum frequency, the digital filter including means for taking numbers representing successive samples of the mixed output signal in blocks and weighting selected numbers of each block so as to reduce the magnitude of at least the first and last number of each block relative to the others whilst having the majority of the numbers within each block, between the first and last, unchanged relative to each other.

4,797,845

PHASE-LOCKED LOOP COEFFICIENT GENERATOR FOR A FILTER ARRANGEMENT HAVING A NON-RATIONAL RATIO BETWEEN INPUT AND OUTPUT SAMPLING FREQUENCIES

Eduard F. Stikvoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,326

Claims priority, application Netherlands, Dec. 18, 1985, 8503478

Int. Cl.[4] G06F *7/38;* H03H *17/06*

U.S. Cl. 364—724.1 4 Claims

1. An arrangement for changing the sampling frequency of a discrete-time signal having a value f_l into a value f_u, one of said two sampling frequencies being equal to f_l and the other being equal to a higher frequency f_h, said arrangement comprising:

(a) first means for supplying low-rate clock pulses occurring at the said rate f_l;

(b) second means for supplying high-rate clock pulses occurring at the said rate f_h;

(c) a filter coefficient generator comprising:

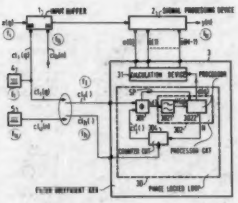
(c1) a deviation circuit to which the low and high-rate clock pulses are applied and which supplies a deviation d which is equal to the product of f_h and a time interval T_d between a low-rate clock pulse and the immediately subsequent or the immediately preceding high-rate clock pulse;

(c2) means to generate a predetermined number of (M) filter coefficients in response to the supplied deviation d, the filter coefficient having ordinal number m being equal to a(m) and being defined by the relation

$$a(m)=h[(d+m)/f_h]$$

wherein the function h represents the pulse response of a finite impulse response filter and m=0, 1, 2, . . . M−1; and

(d) a signal processing circuit for generating at a rate f_u the samples of the discrete-time signal having the changed



sampling frequency by multiplication of samples of the original discrete-time signal by selected filter coefficients and by adding the products thus obtained;

wherein the deviation circuit comprises:

(c1,1) a phase detector to which the low-rate clock pulses are applied on the one hand and to which synthetic low-rate clock pulses are applied on the other hand and which supplies a discrete-time phase difference signal;

(c1,2) a counter circuit adapted to receive a reference value, which circuit receives the high-rate clock pulses as counting pulses and supplies a synthetic low-rate clock pulse each time after receiving a number of high-rate clock pulses which is equal to the reference value; and

(c1,3) a processor circuit receiving the discrete-time phase difference signal and in response thereto supplying deviators and reference values for the counter circuit at the rate f_l.

4,797,846

DIGITAL RESONANT FILTER

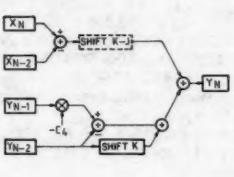
Ferial Benkara, Bagneux, France, and Daniel Campbell, Palos Verdes East, Calif., assignors to Enertec, Montrouge, France

Filed May 17, 1985, Ser. No. 735,234

Claims priority, application France, May 21, 1984, 84 07846

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724.17 **10 Claims**



1. A recursive digital filter, comprising:

at least a first filter stage for receiving successive digital input samples X_N and in response providing successive digital output samples Y_N, said filter stage having a z-transform transfer function

$$H(Z)=(A_0+A_1*Z^{-1}+A_2*Z^{-2})/1+C_4*Z^{-1}+C_5*Z^{-2})$$

and having two zeros at frequencies defined by solutions of the equation:

$$A_0+A_1A^{-1}+A_2Z^{-2}=0$$

and two poles at frequencies defined by solutions of the equation

$$1+C_4*Z^{-1}+C_5Z^{-2}=0$$

said filter stage including

(a) means for positioning the poles and the zeros in a circle of unitary radius centered at the origin of the real and imaginary axes of the complex plane, the poles being represented by complex coordinates the polar radius of which is sufficiently close to unity such that the filter stage provides a filter pass band about a center frequency, the arguments of which are, in absolute value, representative of the center working frequency of said stage;

(b) means for forming coefficients A_0 and A_2 of the transfer function to be substantially equal and of opposite sign and a coefficient A_1 to be zero, with the zeros positioned at points along or close to the real axis of respective abscissae −1 and +1; and

(c) means for forming a coefficient C_5 to be greater in magnitude than 0.8,

the filter stage filtering by resonance a band centered about a resonant frequency, the bandwidth of the filter stage and its gain for a signal at the resonant frequency depending only upon the difference between unity and the polar radius of poles.

4,797,847

DISCRETE COSINE TRANSFORMER

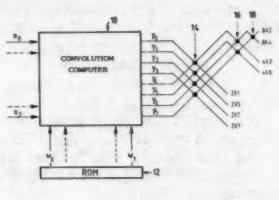
Pierre Duhamel, 97, avenue de Verdun, 92130 Issy les Moulineaux, France

Filed Feb. 4, 1987, Ser. No. 10,702

Claims priority, application France, Feb. 6, 1986, 86 01629

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—725 **3 Claims**



1. A device for computing the discrete cosine transform X_k of a signal x represented by N digitized samples $x_0, \ldots, x_i \ldots x_{N-1}$, where N is a power of 2:

$$X_k = \sum_{i=0}^{N-1} x_i \cos\left[(2\pi/4N)(2i+1)k\right]$$

comprising:

means for storing a predetermined sequence of samples w_i (N);

convolving means connected to receive said N digitized samples x_i, and said predetermined sequence of samples w_i(N) and arranged to carry out a convolution between the samples x_i and said stored sequence of samples w_i(N) and to provide N convolution products having indices i from 0 to N−1; and

a set of identical elementary circuits distributed into a plural-

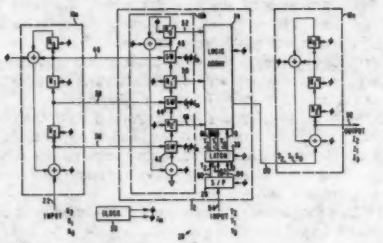
ity of serially connected banks, each circuit having two inputs and two outputs one of which delivers the sum and the other the difference of the two inputs, each of the elementary circuits of the first bank being connected to receive, on its two inputs, samples of the convolution products whose indices are separated by N/2 from each other.

4,797,848

PIPELINED BIT-SERIAL GALOIS FIELD MULTIPLIER

Douglas R. Walby, Pomona, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 18, 1986, Ser. No. 853,529
Int. Cl.[4] G06F 7/38, 7/52
U.S. Cl. 364—754 18 Claims



1. A pipeline Galois Field (2^m) multiplier for multiplying elements of a finite field, represented by factors K(X) and Y(X), to obtain a product Z(X), wherein K(X) has the form $K(X)=K_{m-1}X^{m-1}+K_{m-2}X^{m-2}+\ldots+K_0$, Y(X) has the form $Y(X)=Y_{m-1}X^{m-1}+Y_{m-2}X^{m-2}+\ldots+Y_o$ and Z(X) has the form $Z(X)=Z_{m-1}{}^{m-1}+Z_{m-2}X^{m-2}+\ldots+Z_o$, said multiplier apparatus comprising:

(a) a serial in, parallel out input shaft register buffer circuit having m serially arranged register stages R_{m-1}, R_{m-2}, . . . , R_0 and being connected for serially receiving the K(X) coefficients K_{m-1}, K_{m-2}, . . . , K_0;

(b) computer means connected for receiving, in parallel, at a preselected clock pulse, the contents of the R_{m-1}, R_{m-2}, . . . , R_0 register stages of the initiating register circuit and for serially receiving the Y(X) coefficients Y_{m-1}, Y_{m-2}, . . . , Y_0, and for operating thereon to provide an intermediate series of m logic functions $S_i=f_{m-1}Y_{m-1}+f_{m-2}Y_{m-2}+\ldots+f_0Y_0$, wherein f_{m-1}, f_{m-2}, . . . , f_0 are functions of K_{m-1}, K_{m-2}, . . . , K_0;

(c) a serial in serial out output shift register circuit having m serial arranged shift register stages R_{m-1}'', R_{m-2}'', . . . , R_0'' and being connected for serially receiving the series of m logic functions S_i from the computing means and, in response thereto, providing a serial output of Z(X) product coefficients Z_{m-1}, Z_{m-2}, . . . , Z_0; and

(d) timing means for providing clock pulses to the input and output shift register circuits and to the computing means for synchronizing the operation thereof.

4,797,849

PIPELINED VECTOR DIVIDE APPARATUS

Hiraku Nakano, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

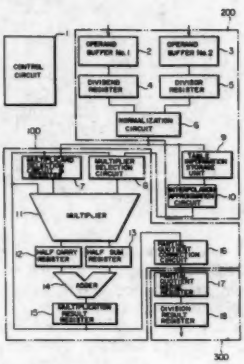
Filed Nov. 13, 1986, Ser. No. 929,913
Claims priority, application Japan, Nov. 19, 1985, 60-259448
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—765 5 Claims

1. A vector divide apparatus comprising:

pre-processing means including a dividend register for sequentially storing each vector element of a dividend, a divider register for sequentially storing each vector element of a divisor, and a normalization circuit connected to said dividend register and divisor register for normalizing either a vector element in said dividend register or a vector element in said divisor register;

main processing means connected to said pre-processing means for obtaining a quotient vector element, including at least one multiplier for calculating a partial quotient of a predetermined bit length for each of a predetermined number of vector elements sequentially from a high order through iterative calculations;

post-processing means connected to said main processing means for merging a plurality of the partial quotients obtained through said iterative calculations by said main processing means so as to obtain a quotient vector element of a desired bit length as a result of the divide operation between said dividend vector element and said divisor vector element; and



control means, connected to said pre-processing means, main processing means and post-processing means, for controlling said main processing means so as to prevent an idle duration in the operation of said multiplier in such a manner that the multiplications for (i+1)-th vector elements follow immediately after the multiplication for obtaining final partial quotient i-th vector elements, and for controlling said pre-processing means and said post-processing so that said pre-processing means and post-processing means are operated at a time interval equal to the total time elapsed during said iterative calculations performed by said main processing means to obtain a quotient vector element, in such a manner that an (i+1)-th dividend vector element and an (i+1)-th divisor vector element are input to said pre-processing means before an i-th quotient vector element is outputting from said post-processing means.

4,797,850

DYNAMIC RANDOM ACCESS MEMORY CONTROLLER WITH MULTIPLE INDEPENDENT CONTROL CHANNELS

Zwie Amitai, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 12, 1986, Ser. No. 862,081
Int. Cl.[4] G06F 9/00; G11C 19/00
U.S. Cl. 364—900 9 Claims

1. A dynamic random access memory controller for providing address and control signals to memory banks comprising:

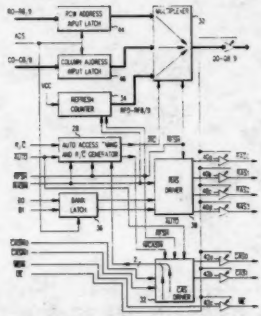
means for providing address and control signals, including row address, column address, row address strobe and a plurality of column address strobe signals;

row address strobe driver means coupled to said row address

strobe input signal providing means for producing a multiplicity of row address strobe output signals;

column address strobe driver means coupled to said plurality of column address strobe input signals providing means for producing a like plurality of column address strobe output signals which are processed independently in separate channels;

means for providing an address latch strobe signal, and a bank latch coupled to a source of a pair of bank select



input signals and to said address latch strobe signal providing means for enabling one of the row address strobe output signals; and

a multiplexer coupled to said row address, column address, and row address strobe providing means for selecting row address and column address signals to produce a multiplexed output of said row address and column address signals, whereby said controller operates to selectively access individual or combinations of bytes in a data word.

4,797,851

DATA TRANSFER CONTROL EQUIPMENT

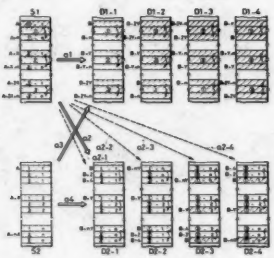
Yoshito Suzuki, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,926

Claims priority, application Japan, Dec. 24, 1984, 59-270813

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—900 **17 Claims**



1. A data transfer control device whose operation is controlled by a microprocessor, comprising:

a plurality of registers into which source address data, destination address data, first offset data and second offset data are set; and

controller means for performing a control operation for transferring data stored within a storage location indicated by a device address designated by said source address data into a storage location indicated by a device address designated by said destination address data, an arithmetic operation for updating said source address data using an offset value designated by said first offset data and an arithmetic operation for updating said destination address data using an offset value designated by said second offset data.

7. A method of controlling data transfer in a microcomputer system having a microprocessor, first memory means for holding data, second memory means for holding data and a memory access controller having a plurality of registers, comprising the steps of:

(a) storing source address data in a first register;

(b) storing destination address data in a second register;

(c) storing first offset data in a third register;

(d) transferring data from a first region in said first memory means designated by said source address data in said first register into a second region in said second memory means designated by said destination address data in said second register;

(e) updating said source address data using an offset value designated by said first offset data in said third register; and

(f) transferring data from a third region in said first memory means designated by the source address data updated in step (e) into a fourth region in said second memory means which is located therein adjacent said second region.

4,797,852

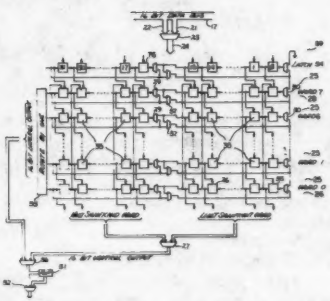
BLOCK SHIFTER FOR GRAPHICS PROCESSOR

Sunil Nanda, Santa Cruz, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 3, 1986, Ser. No. 825,652

Int. Cl.[4] G06F *7/00*; G11C *19/00*

U.S. Cl. 364—900 **23 Claims**



1. In data processing system, an apparatus for shifting video pixel data stored in a memory, comprising:

storage means for storing a plurality of selected bits from said memory and said storage means configured as a matrixed array of individual registers, such that each individual register is coupled to all adjacent registers to provide for shifting an array of video pixel data in any direction along any dimension of said array;

shifter means coupled to said storage means for interchanging positions of said bits by vertically and horizontally shifting each of said video pixel data by one position at a time within said array such that said bits which are located at the edges of said matrixed array have two possible transitions, an output transition allowing for shifting to said memory, and a wrap around transition allowing for shifting and rotating back into said storage means forming a circular loop;

transfer means coupled to said storage means and said memory for transferring said video pixel data as a sequence of

words having a horizontal transition and a vertical transition;

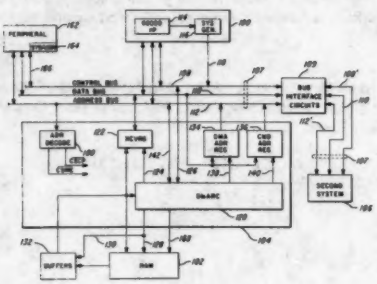
whereby a block shifting of data in said memory is achieved.

4,797,853

DIRECT MEMORY ACCESS CONTROLLER FOR IMPROVED SYSTEM SECURITY, MEMORY TO MEMORY TRANSFERS, AND INTERRUPT PROCESSING

Shaun V. V. Savage, Bountiful, and Johnny M. Harris, Woods Cross, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 15, 1985, Ser. No. 798,532
Int. Cl.[4] G06F *12/14, 13/14*
U.S. Cl. 364—900 **17 Claims**



1. In a data processing system including a system processor, a plurality of units having addressable memory space, and a bus over which data may be transferred between said units, the improvement comprising:

a plurality of controllers connected to said bus, each of said controllers being associated with one of said units by connection thereto;

each of said controllers including,

first means for placing an address on said bus, said address being an address in the memory space of a unit associated with one of said controllers other than the one placing said address;

second means for generating and placing on said bus a security level signal indicating the security level of memory space which the controller may access;

third means for storing limiting addresses defining boundaries for each security level of the memory space in the unit associated with the controller, said boundaries defining at least a lower security level memory space and a higher security level memory space;

fourth means responsive to a security level signal placed on said bus by any other controller for selecting one of said limiting addresses;

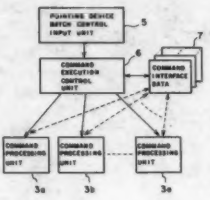
fifth means for comparing said selected limiting address and an address placed on said bus, said fifth means producing an error signal when the address placed on said bus by a given controller is an address in said memory space having a higher security level than that of the security level signal placed on said bus by said given controller.

4,797,854

OPERATING SYSTEM FOR CONTROLLING MAN-MACHINE INTERACTION IN INFORMATION PROCESSING SYSTEM

Katsuichi Nakazaki, and Yasumasa Nonoyama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,097
Claims priority, application Japan, Feb. 20, 1986, 61-35713
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **10 Claims**



1. A man-machine interface operating system, including display means, for interactive processing of input data given by means of input means in accordance with a menu displayed on the display means, which comprises:

input batch operation means which receives input data from the input means;

command execution control means which produces and/or updates interface data for executing a command based on the input data received by the input batch operation means, and makes a decision based on the interface data as to whether the command to be executed is a continuous command or a new command;

command processing means which processes the command selected by the command execution control means;

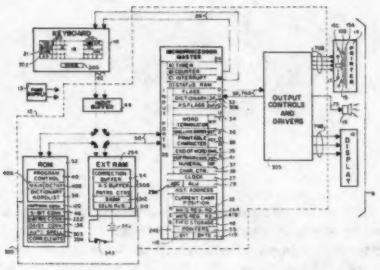
whereby a command execution routine is repeated according to the produced and/or updated interface data for executing the command.

4,797,855

WORD PROCESSOR HAVING SPELLING CORRECTOR ADAPTIVE TO OPERATOR ERROR EXPERIENCE

Howard C. Duncan, IV; R. William Gray, both of Ithaca, and Joseph P. Battista, Homer, all of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Jan. 6, 1987, Ser. No. 700
Int. Cl.[4] G06F *3/02, 11/00, 11/34*
U.S. Cl. 364—900 **10 Claims**



1. In a word-processing system of the kind having operator input through a keyboard with a plurality of depressible keys, a spelling dictionary storing valid words within the system, a

display, and an error-signal generator activated upon entry of an incorrect word as compared with the valid words of the dictionary; the combination of:

(a) a special key included on said keyboard,

(b) storage means holding correction information of at least two kinds,

(c) statistical means for controlling the selection order of said at least two kinds of correction information, comprising an individual counter for a respective one of said at least two kinds of correction information, each said counter storing a count dependent upon the relative extent of prior successful usage of each said kind in amending incorrect words previously entered by said operator;

(d) amending means operable to apply to said incorrect word the one of said kinds of correction information first selected by said statistical means, thereby producing therefrom a trial word for presentation on said display, said amending means being responsive to operator depression of said special key as a reaction to generation of an error-signal;

(e) means for adjusting said statistical means to select a second, next-in-order kind of correction information;

(f) a discrete key on said keyboard, depression of said discrete key rejecting said trial word presenting in said display and causing operation of said means for adjusting to supply said next-in-order kind of correction information to said amending means for application thereof to said incorrect word, thereby producing a new trial word for presentation on said display;

(g) a particular key on said keyboard, operator depression of said particular key indicating a trial word currently presented on the display is accepted as a replacement for said incorrect word; and

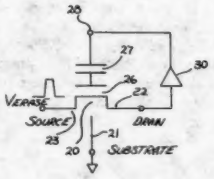
(h) incrementing means for unit incrementation of said individual counter for said next-in-order kind of correction information, said incrementing means responding to said operator depression of the particular key when said new trial word is presented in said display, whereby said statistical means is modified in accordance with the frequency of usage of each said kind of correction information.

4,797,856

SELF-LIMITING ERASE SCHEME FOR EEPROM

Winston K. M. Lee, San Francisco; Duane H. Oto, Santa Clara, and Simon M. Tam, San Mateo, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 16, 1987, Ser. No. 39,086
Int. Cl.[4] G11C 7/00, 11/40
U.S. Cl. 365—185 **14 Claims**



1. An apparatus for self-limiting an electrical erase of a floating gate electrically programmable and electrically erasable read-only memory (EEPROM) cell having first and second doped regions separated by a channel region, and having a floating gate and a control gate overlying said channel region and a portion of said first doped region, comprising:

voltage supply means coupled to said first doped region to provide an erase voltage for discharging electrons from said floating gate to said first doped region;

feedback means coupled to said second region for providing a feedback signal to limit said discharging;

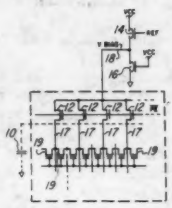
wherein as said floating gate discharges electrons to said first doped region, said second doped region increases in potential and said feedback means uses said potential to provide said feedback signal such that an erasing cycle is terminated prior to over-erasing said EEPROM cell.

4,797,857

ARRAY DISCHARGE FOR BIASED ARRAY

John F. Schreck, Houston; Timmie M. Coffman, and David D. Wilmoth, both of Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 11, 1986, Ser. No. 850,636
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—203 **8 Claims**



1. A discharge circuit for discharging bit lines of an array of semiconductor memory cells in which the bit lines are biased from a common bias line, comprising:

a discharge switch coupled to said bias line for discharging said bit lines and said bias line; and

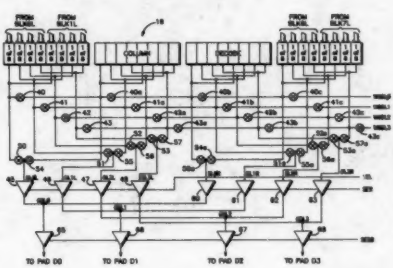
a control circuit coupled to said discharge switch operative to turn on said discharge switch in response to the voltage on said bias line rising above a first predetermined level and then to turn off said discharge switch in response to the voltage on said bias line falling below a second predetermined level.

4,797,858

SEMICONDUCTOR MEMORY WITH DIVIDED WORD LINES AND SHARED SENSE AMPLIFIERS

Karl L. Wang, and Lal C. Sood, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1987, Ser. No. 31,305
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—230 **6 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cells organized into an array of N rows and M columns, said rows and columns being further organized into K blocks, each comprising N rows and M/K columns, each said block being further organized into two half-blocks, each comprising N rows and M/2K columns;

P metal word lines extending across said array in the row direction;

row decoder means for receiving a portion of an address and for selecting one of said P metal word lines in response thereto, a first half of said blocks lying on a first side of said row decoder means and a second half of said blocks lying on a second side thereof;

block decoder means for receiving a portion of said address and for selecting two of said half-blocks in response thereto, one of said selected half-blocks lying on said first side of said row decoder means and the other selected half-block lying on the other side thereof;

local word line selector means for receiving signals from said metal word lines and from said block decoder means and for selecting one local word line for each of said two selected half-blocks;

M pairs of bit lines extending across said array in the column direction;

column decoder means coupled to said M pairs of bit lines for receiving a portion of said address and for selecting L pairs of said bit lines from each said half-block in response thereto; and

sense amplifier means for responding to signals carried on said L pairs of bit lines from each of said selected half-blocks and for providing a plurality of data bits corresponding to said signals at outputs of said memory device;

wherein said sense amplifier means further comprises;

a first plurality of fewer than KL sense amplifiers, each of said first plurality of sense amplifiers being coupled to more than one of said 2KL pairs of bit lines selected by said column decoder means; and

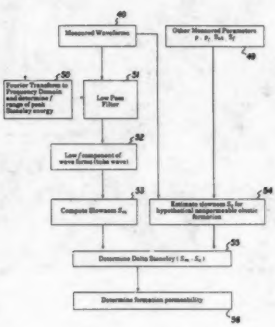
a second plurality of sense amplifiers equal in numbers to said number of data bits, each of said second plurality of sense amplifiers having an input coupled to outputs of more than one of said first plurality of sense amplifiers and an output coupled to said outputs of said memory device.

4,797,859

METHOD FOR DETERMINING FORMATION PERMEABILITY BY COMPARING MEASURED TUBE WAVES WITH FORMATION AND BOREHOLE PARAMETERS

Brian E. Hornby, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 8, 1987, Ser. No. 58,973
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—31 **5 Claims**


Measured Waveforms
Other Measured Parameters
Fourier Transform to Frequency Domain and determine / range of peak Stoneley energy
Low Pass Filter
Low / component of wave forms (tube wave)
Compute Slowness
Estimate slowness for hypothetical impermeable elastic formation
Determine Delta Stoneley
Determine formation permeability

1. A method of determining the permeability of an earth formation traversed by a borehole, using a tool adapted for movement in said borehole, comprising:

transmitting acoustic energy from a first location on said tool;

measuring the acoustic wave forms of the transmitted energy at a plurality of locations on said tool at varying distances from said first location;

filtering each of said wave forms to obtain a tube wave component;

determining a measured slowness parameter of said tube wave component;

generating a value of the computed slowness parameter for said borehole under the conditions of an elastic nonpermeable medium;

determining the difference between the measured slowness parameter and the computed value;

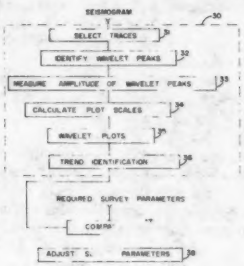
determining the permeability of said formation in response to the difference between said measured slowness parameter and said computed value.

4,797,860

METHOD FOR SHOT POINT ANALYSIS OF SEISMIC REFLECTION SIGNALS

Carl A. Quaglino, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,903
Int. Cl.[4] G01V *1/36, 1/28*
U.S. Cl. 367—47 **9 Claims**



1. A method for conducting a marine seismic survey along a line of exploration, comprising the steps of:

(a) traversing said line of exploration with a seismic survey system having an acoustic energy source, an array of spaced-apart receivers, and a recording system,

(b) firing said acoustic energy source at a plurality of shot points along said line of exploration.

(c) recording the seismic reflections signals received by one of said receivers for each of said shot points,

(d) selecting a common wavelet in said recorded seismic signals of said receiver for each of said shot points,

(e) measuring the amplitudes of said common wavelet of said receiver over said plurality of shot points, and

(f) comparing said measured amplitudes to identify a trend from shot point to shot point over said plurality of shot points in an actual value of a seismic survey parameter.

4,797,861

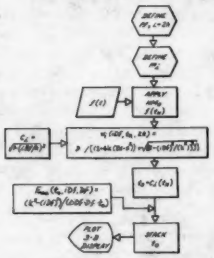
METHOD OF PROCESSING SEISMIC DATA

Craig J. Beasley, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 779,176, Nov. 16, 1985, Pat. No. 4,742,497. This application Mar. 30, 1988, Ser. No. 175,274
Int. Cl.[4] G01V *1/04*
U.S. Cl. 367—50 **4 Claims**

1. A method for stacking three dimensional seismic data to form a seismic section, the data consisting of a plurality of traces corresponding to individual source-to-receiver pairs stacked into a plurality of cells geometrically defined on a representation of the surface of the earth and in which stacking is based upon a selected root-mean-squared velocity, comprising the steps of:

(a) normal-moveout correcting each trace prior to stacking based on the source-to-receiver distance for each trace;



(b) weighting each normal-moveout corrected trace to compensate for geometric spreading between the source-to-receiver pairs according to the expression:

$$w_l(iDf,t_n,2k) = Df/[(1 + 4k(2s - s^2)) \times \sqrt{[(1 - (iDf)^2/(k^2))^3]}\ ]$$

where:
w_l an amplitude weighting coefficient;
iDf is one half the dimension of the cell;
t_n is a normal moveout corrected time;
k is one-half the offset distance;
Df is the cell spacing between said plurality of cells along a line including the source-to-receiver pairs;
s is equal to $t_n(2/F)$; and
F is equal to the dominant frequency; and

(c) altering the resultant normal-moveout corrected and weighted traces by a moveout coefficient which is a function of a relative distance between said plurality of cells into which each trace is to be stacked and the midpoint between the source and receiver corresponding to that trace, the altering of the traces made according to the expressions:

$$t_o = C_l \times t_n; \text{ and}$$

$$C_l = \sqrt{(1 - (iDf/K)^2)}\ ;$$

where: t_o is the altered travel time seismic signal; and

(d) limiting local frequency content of each normal-moveout corrected trace to avoid aliasing artifacts in the stacked seismic data according to the expression:

$$F_{max}(t_o,iDf,Df) = (k^2 - (iDf)^2)/(2iDf \times Df \times t_o),$$

where F_{max} is the maximum allowable frequency.

4,797,862

SEISMIC GENERATOR

Serge S. Wisotsky, Tulsa, Okla., assignor to Industrial Vehicles International, Inc., Tulsa, Okla.

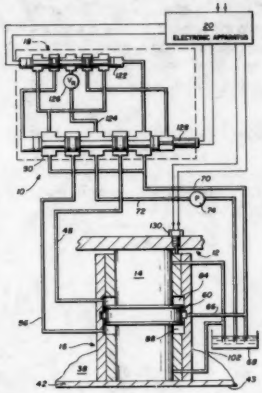
Continuation of Ser. No. 885,245, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 670,378, Nov. 9, 1984, abandoned. This application Feb. 13, 1987, Ser. No. 15,091
Int. Cl.[4] H04R 1/02
U.S. Cl. 367—143 **14 Claims**

1. A seismic generator for creating vibratory signals in liquid comprising in combination:

a housing assembly including a post assembly projecting centrally therefrom, said post assembly having a sidewall, first and second power passageways therein extending through said sidewall and a relief passageway extending through said sidewall between said first and second power passageways;

a piston assembly mounted for reciprocating travel on said post assembly and having a surface thereon arranged to egage the liquid, said piston assembly encircling said post assembly and including means for providing fluid communication between said first power passageway and said relief passageway and between said second power passageway and said relief passageway, respectively, before said piston assembly has reached each end of its travel;

said piston assembly and said post assembly cooperating to provide an expansible first power chamber and an expansible second power chamber communicating, respectively with said first and second power passageways to enable relative reciprocating travel between said piston asssembly and said post assembly;



valve means connected with said passageways and for connection to a source of pressurized fluid; and

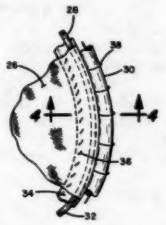
control means responsive to the relative position of said post assembly and said piston assembly for controlling said valve means to direct pressurized fluid to an appropriate one of said power passageways to cause reciprocation of said piston assembly for production of vibratory signals in the liquid.

4,797,863

UNDERWATER ACOUSTICAL TRANSDUCER

Manuel A. Gonzalez, and David L. Hutchins, both of Seattle, Wash., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 22, 1986, Ser. No. 944,050
Int. Cl.[4] H04R 17/00
U.S. Cl. 367—157 **17 Claims**



1. An underwater acoustical transducer including:

a diaphragm, a frame, and means for securing the periphery of said diaphragm with respect to said frame, said frame having a select deployment configuration and elastically deformable into configurations other than said select deployment configuration; and

a flexible piezoelectric transducing element at least substantially adjacent said frame, running the length of said frame and conforming to the configuration of said frame; and means for fastening said transducing element with respect to said frame;

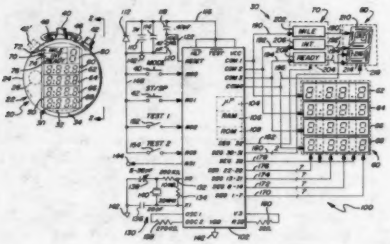
wherein said transducing element includes a first coaxial cable with an electrically conductive core surrounded by a flexible piezoelectric material, said coaxial cable substantially adjacent a radially outward surface of said frame, and wherein said means for fastening said transducing element with respect to said frame include a plurality of loops around said first coaxial cable and threaded through the periphery of said diaphragm.

4,797,864

RACE STOPWATCH WITH PLURAL DISPLAYS AND OPERATING MODES

Robert R. Stano, Belleville, and Richard H. Harrington, Ann Arbor, both of Mich., assignors to Robert R. Stano, Belleville, Mich.

Filed Oct. 9, 1987, Ser. No. 106,473
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—111 **17 Claims**



1. A hand-holdable, self-contained, portable stopwatch having a plurality of different modes of operation for measuring and displaying a plurality of intervals of time representing the elapsed times a racer has taken to cover successive predetermined distances, comprising:

time-base means for providing an internal source of timing signals for the stopwatch;

first operator-actuatable input switch means for generating first input commands designating start and stop points of the plurality of intervals of time to be measured;

second operator-actuatable input switch means for generating second input commands for switching the stopwatch between at least first and second distinct timing modes of operation;

timing means connected to the time-base means for successively measuring the duration of each of the plurality of intervals of time designated by the input commands received from the first input means;

first display means for simultaneously displaying at least a plurality of multiple-digit values respectively representing the measured duration of at least two of the plurality of intervals of time;

second display means distinct from the first display means for indicating when the stopwatch is in its first timing mode when the stopwatch is in its second timing mode;

third display means distinct from the first display means for displaying at least one alphanumeric symbol indicating which of the plurality of intervals of time the stopwatch is currently set up to time, and

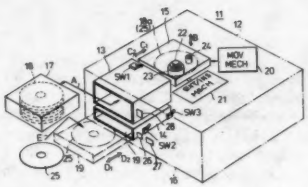
wherein said timing means including microprocessor means for controlling the sequence of automatic operations of the stopwatch in response to input commands received from the first and second input means, including automatically operating the display means and providing the first and second timing modes, with the operation of the first timing mode including measuring at least a plurality of overlapping intervals of time having a common start point and different stop points, and with the operation of the second timing mode including measuring at least a plurality of successive non-contiguous intervals of time such that the stop point of any one such interval is separated by an operator-determined length of time from the start point of the next interval of time if any to be measured.

4,797,865

INFORMATION RECORDING DISC PLAYER HAVING RECEIVING PARTS FOR RECEIVING A PLURALITY OF DISC CARTRIDGES

Tooru Imai, Yamato; Kouichi Mutou, Chigasaki; Hidetoshi Yamazaki, Atsugi, and Masae Murata, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 54,854
Claims priority, application Japan, Jun. 2, 1986, 61-84260
Int. Cl.[4] G11B *23/04*
U.S. Cl. 369—39 **8 Claims**



1. An information recording disc player for playing an information recording disc, said information recording disc player comprising: a main player body;

a first receiving part in said main player body for receiving a first disc cartridge which can accommodate a plurality of information recording discs each put on a tray;

a second receiving part in said main player body for receiving a second disc cartridge which can only accommodate a single information recording disc put on a tray, said first and second receiving parts being arranged so that the information recording discs accommodated within said first and second disc cartridges are arranged coaxially when said first and second disc cartridges are in said first and second receiving parts, respectively, said first and second receiving parts being open at first and second predetermined openings of a front panel of the main player body, respectively:

means for ejecting said first disc cartridge from said first receiving part through said first predetermined opening of the front panel of the main player body;

means for moving said second disc cartridge through said second predetermined opening of the front panel of the main player body between a disc receive/eject position, where said single information recording disc can be set into and removed from said second disc cartridge, and a loaded position within said second receiving part;

a disc playing unit in said main player body for playing an information recording disc; and

a mechanism for selectively loading an information recording disc on said disc playing unit from either one of said first and second disc cartridges in said first and second receiving parts and for unloading the information recording disc from said disc playing unit into the disc cartridge from which the information recording disc was originally loaded,

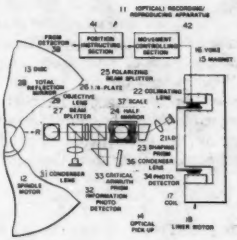
said mechanism comprising a first mechanism for moving said disc playing unit in a first direction so that said disc playing unit confronts one information recording disc accomodated within one of said first and second disc cartridges in said first and second receiving parts, and a second mechanism including a slider for extracting said one information recording disc together with the tray from said one disc cartridge to be loaded on said disc playing unit and for inserting said one information recording disc together wit the tray unloaded from said disc playing unit into said one disc cartridge, said slider moving in a second direction perpendicular to said first direction, said second mechanism being mounted on said disc playing unit to be moved together with said disc playing unit by said first mechanism.

4,797,866

OPTICAL RECORDING/REPRODUCING APPARATUS

Shoji Yoshikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1987, Ser. No. 16,687
Claims priority, application Japan, Feb. 19, 1986, 61-034067
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—43 **8 Claims**



1. An optical recording/reproducing apparatus, comprising:

(a) a laser source for generating a light beam for recording-/reproducing operation;

(b) an optical pickup including:

(1) information reproducing photodetector means for receiving a light returned from a recording medium for optically recording/reproducing information to reproduce data recorded in the recording medium;

(2) control photodetector means for receiving the light returned from the recording medium to effect position control of the light beam;

(3) pickup position detecting means for detecting a position of said optical pickup; and

(4) an optical system for guiding the light beam from said laser source to the recording medium, said information reproducing photodetector means, and said control photodetector means; said optical system

including half mirror means for dividing the light beam from said laser source to a transmitted beam directed to the recording medium and a reflected beam directed to said pickup position detecting means, and for reflecting light returned from said recording medium to said control photodetector means; and

(c) pickup moving means for moving at least a part of said optical pickup in a track traverse direction;

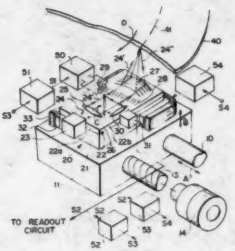
whereby said pickup position detecting means will detect the position of said optical pickup in response to said reflected beam and said control photodetector means will control the position of the transmitted beam on the recording medium in response to said light returned from the recording medium.

4,797,867

PICK-UP HEAD FOR OPTICAL INFORMATION STORAGE DISK

Hiroshi Sunagawa, and Kozi Kamiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 15, 1986, Ser. No. 919,015
Claims priority, application Japan, Oct. 16, 1985, 60-230289
Int. Cl.[4] G11B *7/095*
U.S. Cl. 369—45 **4 Claims**



1. A pick-up head and tracking control for use with an optical disk, comprising in combination:

(i) an optical waveguide made of a material capable of a propagating a surface elastic wave;

(ii) a light source for emitting light into said optical waveguide;

(iii) a waveguide lens for converting wave light traveling through said optical waveguide into parallel-ray wave light;

(iv) a focusing grating coupler formed on a surface of said optical waveguide for guiding the wave light out of the surface of said optical waveguide and for focusing the wave light onto a surface of the optical disk;

(v) a light detector for detecting light which has been reflected by the surface of the optical disk back into said optical waveguide through said focusing grating coupler;

(vi) means for generating on said optical waveguide a surface elastic wave which travels in a direction across a path of said parallel-ray wave light for deflecting the wave light;

(vii) a tracking error detector circuit for detecting a tracking error of light focused on the surface of the optical disk relative to a track on the optical disk by said focusing grating coupler and for generating a tracking error signal indicative of the detected tracking error; and

(viii) a control circuit for controlling said generating means to vary a frequency of said surface elastic wave dependent on said tracking error signal in order to eliminate said tracking error by deflection of the wave light in a direction across the track.

4,797,868

OPTICAL SYSTEM EMPLOYING A LASER BEAM FOR FOCUSING, TRACKING AND TRANSFERRING INFORMATION SIGNALS WITH RESPECT TO A MAGNETO-OPTICAL MEMORY

Hideo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

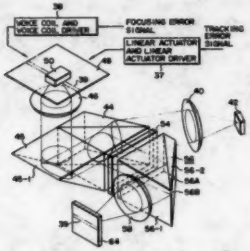
Filed May 13, 1986, Ser. No. 862,829
Claims priority, application Japan, May 15, 1985, 60-103323; May 16, 1985, 60-104422; May 22, 1985, 60-109564
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **19 Claims**

1. An optical system for use with an optical memory comprising:

means for directing a light beam onto a surface of said optical memory;

means for separating light reflected from said surface of said

optical memory into a plurality of resultant light beams, said separating means including a plurality of light reflecting surface portions each arranged at a different angle


VOICE COIL AND VOICE COIL DRIVER
FOCUSING ERROR SIGNAL
TRACKING ERROR SIGNAL
LINEAR ACTUATOR AND LINEAR ACTUATOR DRIVER

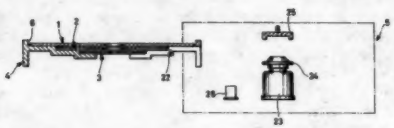
relative to said optical memory to cause each of said resultant light beams to converge onto a single plane; and means for detecting said resultant light beams as said resultant light beams converge upon said plane.

4,797,869

DISK DETECTING APPARATUS

Toshio Hirano, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,121
Claims priority, application Japan, Jul. 16, 1986, 61-167562
Int. Cl.[4] G11B *17/04, 25/04*
U.S. Cl. 369—75.2 **9 Claims**



1. A disk detecting apparatus comprising:

a casing;

a turntable in said casing;

a carrier moveable between a first position wherein a disk may be loaded on said carrier and a second position wherein said carrier is centered in said casing over said turntable, said carrier including a plurality of disk mounting surfaces and a plurality of position restriction portions for mounting disks having different diameters on respective ones of said disk mounting surfaces;

first detecting means for detecting the position of said carrier; and

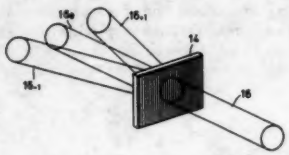
second detecting means positioned in said casing for detecting the presence of a disk on said carrier adjacent said detecting means at several successive positions of said carrier as said carrier moves from said first position to said second position, whereby the number of carrier positions at which said second detecting means detects the presence of said disk is an indication of the diameter of said disk.

4,797,870

OPTICAL RECORDING AND REPRODUCING APPARATUS

Tadao Nagai, Sagamiko, and Kenichi Sato, Tokyo, both of Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,380
Claims priority, application Japan, Sep. 20, 1986, 61-222982
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—100 **4 Claims**



1. An optical recording and reproducing apparatus comprising:

an optical disc having a recording surface;

a laser diode emitting a laser beam;

an optical lens for changing the laser beam into a parallel laser beam;

a diffraction grating for diffracting the parallel laser beam and generating 0-order and ±1st diffracted lights, a light intensity ratio of each of the ±1st diffracted lights to the 0-order diffracted light ranging from 8:1 to 9:1; and

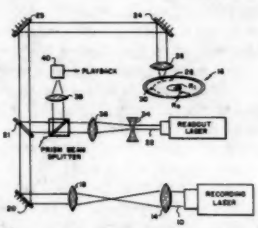
an optical system for forming spot lights of the 0-order and ±1st diffracted lights on the recording surface of said disc and extracting the 0-order and ±1st diffracted lights which have been reflected from the recording surface.

4,797,871

ERASABLE OPTICAL RECORDING METHOD

Yuan S. Tyan; Kee C. Pan, both of Webster, and Fridrich Vazan, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,553
Int. Cl.[4] G11B *7/24*
U.S. Cl. 369—100 **5 Claims**



1. A method of writing and erasing on a optical recording element comprising the steps of:

a. providing an optical recording element comprising a support and an amorphous thin film of a GeTe alloy; wherein the ratio of Ge:Te in the film is 45/55 to 70/30 on an atom-to-atom basis

b. preparing the thin film for writing and erasing cycles by:

i. heating the film, or a selected portion thereof, above its melting point using a pulsed laser or light beam; rapidly cooling the film to form a phase-segregated amorphous state evidenced by the appearance of regions of different densities; and then heating the same areas of the film with a focused beam to below its melting point to transform

those areas from the phase-segregated amorphous state into a crystalline state; or,

ii. crystallizing the film, or a selected portion thereof, by heating the film to its crystallization temperature;

c. writing on selected portions of the thus prepared film with a focused information modulated laser beam, thereby converting those portions on the films upon which the laser beam has been focused to a phase-segregated amorphous state from a crystalline state; and,

d. when desired, erasing the written information by heating those portions of the film bearing the written information with a focused unmodulated or high frequency modulated laser beam thereby converting the written portions of the film to a crystalline state from the phase-segregated amorphous state.

4,797,872

METHOD FOR REPRODUCING DATA RECORDED ON OPTICAL CARD

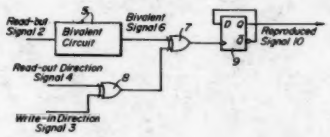
Takao Rokutan, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Aug. 13, 1987, Ser. No. 84,844

Claims priority, application Japan, Aug. 15, 1986, 61-190621

Int. Cl.[4] G11B 7/00; G06K 7/10

U.S. Cl. 369—109 **7 Claims**



1. A method for reproducing data recorded on an optical card on which said data has been recorded by modulating distances between successive pits comprising the steps of:

moving the optical card and an optical reading device relative to each other in a reciprocal manner to derive a read-out signal; and

processing said read-out signal to derive a reproduced signal by detecting distances between front or rear edges of pits viewed in a write-in direction of pits.

4,797,873

DISK CRAMP APPARATUS

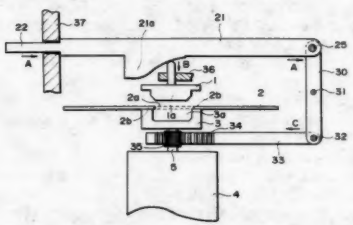
Toshiyuki Nobutani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,222

Claims priority, application Japan, Apr. 24, 1986, 61-093313

Int. Cl.[4] G11B 17/02

U.S. Cl. 369—270 **8 Claims**



1. A disk cramp apparatus comprising:

(a) means for holding a disk, said holding means including a first half for rotating said disk and a second half for pressing said disk rotatably against said first half of said holding means;

(b) means for moving said second half of said holding means from a disk non-hold position to a disk hold position; and

(c) torque applying means for converting a force generated by the movement of said moving means into a torque and applying the torque to said first half of said holding means.

4,797,874

CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF COMMUNICATION SIGNALS

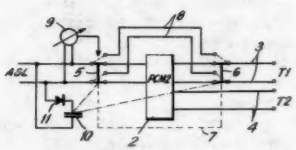
Ziaedin Chahabadi, Bad Münder, and Christian Prenner, Langenhagen, both of Fed. Rep. of Germany, assignors to kabelmetal electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 86,104

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1986, 3633057

Int. Cl.[4] H04J 1/16, 3/14

U.S. Cl. 370—16 **5 Claims**



1. In a circuit arrangement for the transmission of intelligence signals between a central office and two subscribers who are connected over a common subscriber line to the central office, wherein the intelligence signals are transmitted from the central office over the subscriber line in digital form to a conversion device in which incoming digital signals are converted into analog signals and vice versa, and wherein the conversion device is connected to the two subscribers by cables; the improvement comprising

a first switch connected to the subscriber line;

a second switch connected to a cable of one of the subscribers, said first and said second switches being operatively coupled to each other;

a bypass line electrically connecting said first switch to said second switch;

a measuring device which detects a dc voltage present on the subscriber line, said measuring device being connected to the subscriber line between the central office and said first switch, said measuring device being electrically connected to said first and said second switches for operating each of said switches; and wherein

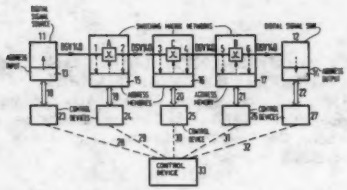
said measurement device responds to a voltage which is less than a predetermined value by operating each of said switches to connect the bypass line to the subscriber line and to the cable of one subscriber while disconnecting said conversion device; and

said measuring device responds to a voltage which exceeds a predetermined voltage by operating each of said switches to connect said conversion device to the subscriber line and to the cable of said subscriber while disconnecting said bypass line.

4,797,875
METHOD FOR MONITORING AND CONTROLLING THE TRAFFIC IN DIGITAL TRANSMISSION NETWORKS

Reginhard Pospischil, Graefelfing; Peter Breitfelder, Taufkirchen, and Uwe Timmermann, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,375
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1985, 3524381
Int. Cl.[4] H04J 3/12, 3/24
U.S. Cl. 370—92 13 Claims



1. A method for monitoring and controlling the traffic in digital transmission networks which comprise a plurality of sections and circuit switching devices of a multiplex hierarchy stage, comprising the steps of:

inserting an identification character in each pulse frame of the digital signal to be transmitted at the beginning of each digital signal connection;

forming the identification characters with information concerning the traffic relationships of the individual digital signal connection;

monitoring the respective identification characters at the circuit switching devices and/or at the data sinks of the multiplex hierarchy stage;

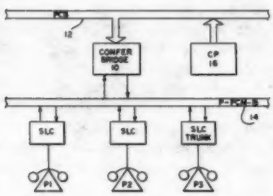
transmitting the identification character of the desired digital signal connection to the appertaining circuit switching devices via a control network; and

controlling the circuit switching devices in accordance with the transmitted identification characters.

4,797,876
CONFERENCING BRIDGE

Reginald Ratcliff, Atlanta, Ga., assignor to Solid State Systems, Inc., Kennesaw, Ga.

Filed Jul. 10, 1987, Ser. No. 72,254
Int. Cl.[4] H04J 3/02; H04M 3/56
U.S. Cl. 370—62 36 Claims



1. A conferencing bridge for supporting a telephone conversation involving more than two parties wherein each party transmits a unique PCM bit stream and receives a unique PCM bit stream; comprising:

means for receiving first and second incoming serial PCM highways carrying said transmit and receive PCM bit streams;

means for converting serial data on said PCM highways to parallel data;

arithmetic logic means for implementing a conferencing algorithm and producing a sequence of PCM outputs;

means for providing valid output PCM data when an arithmetic overflow occurs without passing said arithmetic logic unit output through a PROM so that propagation delay is minimized;

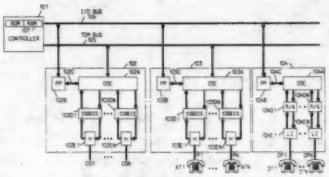
means for providing valid output PCM data when a sum is being cleared without passing said arithmetic logic unit output through a PROM so that propagation delay is minimized; and

means for receiving the PCM outputs from said arithmetic logic means, separating said outputs by highway, and converting said outputs to serial data streams.

4,797,877
COMMUNICATION SYSTEM DYNAMIC CONFERENCER CIRCUIT

Kevin T. Pope, Poway, Calif., and David C. Trimble, Holmdel, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 18, 1986, Ser. No. 943,242
Int. Cl.[4] H04Q 11/04
U.S. Cl. 370—62 16 Claims



1. A port circuit including a plurality of ports, each port interfacing a digital device to a digital communication system, said port circuit comprising

a plurality of conference registers for storing digital port signals, wherein each of said conference registers is assignable to any of said plurality of ports; and

assigning means responsive to a signal requesting an N party conference connection (N is an integer >2) for assigning no more than N–2 available ones of said conference registers to each port of said port circuit connected to said N party conference connection.

4,797,878
MULTIPLE VIRTUAL MULTIPOINT MODEM USING TDM/TOKEN THROWING TECHNIQUE

Thomas Armstrong, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Aug. 18, 1987, Ser. No. 86,518
Int. Cl.[4] H04J 3/16; G05B 23/02
U.S. Cl. 370—96 6 Claims

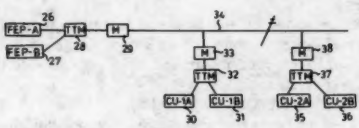
1. A communications system for use on communication channels comprising:

a plurality of front end processors at a master station, each of said front end processors being dedicated to a separate communications network;

a master token transmitter multiplexer having a plurality of inputs, each of said inputs connected to an output of one of said front end processors, having means for generating a token bit stream and having an output which continuously timedivision multiplexes bits of said inputs and said token bit stream in a predetermined sequence;

means for communicating data over the communications channel, input to said transmitting means being said output of said master token transmitter; and

a plurality of remote stations, each of said remote stations comprising a plurality of control units, one control unit



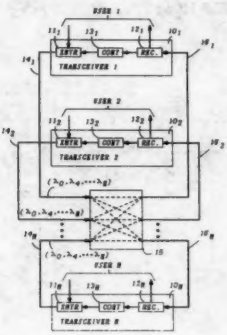
corresponding to each of said dedicated front end processors, a remote means for communicating with the communications channel, and a remote token transmitter multiplexer responsive to said token bit stream for time division multiplexing output between said control units and of said remote communicating means.

4,797,879

PACKET SWITCHED INTERCONNECTION PROTOCOLS FOR A STAR CONFIGURED OPTICAL LAN

Isam M. I. Habbab, Aberdeen; Mohsen Kavehrad, Holmdel, and Carl-Erik Sundberg, Hazlet, all of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 5, 1987, Ser. No. 58,739
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—3 **12 Claims**



1. A method of transmitting packets of information in an optical local area network (LAN) including a plurality of M optical transceivers connected to a Star coupler, the method comprising the steps of:

in transmitting information from a first transceiver to a second transceiver,

(a) transmitting a control information packet at a random time period over a first wavelength division multiplex (WDM) channel using a first access protocol, the control information packet including information relating to (1) a unique identification of the first transceiver, (2) a unique identification of the second transceiver, and (3) an identification of a randomly chosen one of a plurality of N second WDM channels used to transmit data packets, where M>N; and

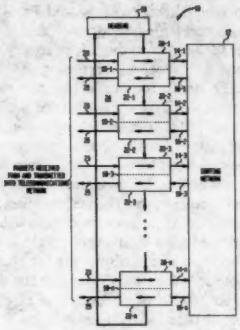
(b) immediately after step (a), transmitting an associated data packet over the chosen one of the plurality of N second WDM channels indicated in the control information packet transmitted in step (a) using a second access protocol.

4,797,880

NON-BLOCKING, SELF-ROUTING PACKET SWITCH

Howard E. Bussey, Jr., Clinton; James N. Giacopelli, Flanders, and William S. Marcus, New Providence, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 7, 1987, Ser. No. 106,575
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 **15 Claims**



1. A full access packet switch for use in a telecommunications network comprising:

a self-routing sorting network having a plurality of inputs and a plurality of outputs, said sorting network being adapted to route a set of packets from said inputs to said outputs so that said packets emerge from said network in an order according to addresses contained in said packets, and

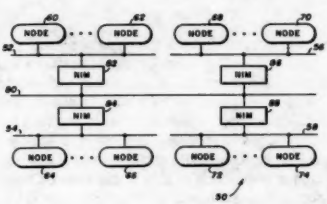
means associated with said inputs for resolving conflicts if more than one packet contains the same output address and for generating dummy packets containing no actual user data to insure that said set of packets includes one packet destined for each output port.

4,797,881

BRIDGE SYSTEM FOR CONNECTING NETWORKS

Amatzia Ben-Artzi, Sunnyvale, Calif., assignor to Sytek, Inc., Mountain View, Calif.

Filed Mar. 12, 1987, Ser. No. 25,386
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—88 **14 Claims**



1. A network interface module (NIM) for connecting a local area network to a backbone network comprising:

a first interface means connected to a local area network for transmitting and receiving local area network messages to and from said local area network;

a second interface means connected to a backbone network for transmitting and receiving backbone network messages to and from said backbone network;

a memory means connected to said first and second interface means for storing a bridge identification address of a particular NIM, a table of addresses, and for temporarily storing said local area network and backbone network messages; and

a logic means connected to the first and second interface means and the memory means for storing a local area network source address in said local area network message in said table of addresses in association with said bridge identification address of said particular NIM, comparing a destination address in said local area network message with said table of addresses, and if the destination address is associated with the bridge identification address of said particular NIM, then ignoring said local area network message, and if the destination address is associated with a bridge identification address of a NIM other than said particular NIM, then enveloping said local area network message in a backbone network message having a header specifically addressed to said other NIM, and if the destination address is not associated with any of the addreses in said address table then enveloping said local area network message in a backbone netowrk message addressed to be multicast to all other NIMs on said backbone network, the logic means also being for storing local area network source address information in said backbone message in said table of addresses in association with a bridge identification address in said backbone message, and de-enveloping said backbone network message for transmission to said local area network.

4,797,882

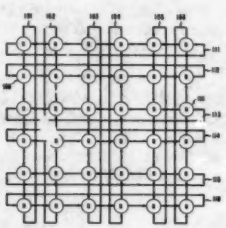
MESH-BASED SWITCHING NETWORK

Nicholas F. Maxemchuk, Mountainside, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 2, 1985, Ser. No. 782,969

Int. Cl.[4] H04J 3/24

U.S. Cl. 370—94 **15 Claims**



1. A communication network having a plurality of nodes, each adapted for coupling a device to said network and having a first and second incoming link and a first and second outgoing link, with said plurality of nodes being approximately equally divided among a plurality of row groups and also approximately equally divided among a plurality of row groups and also approximately equally divided among a plurality of column groups, each of said nodes thereby belonging to a row group and to a column group, charcterized by:

each of said nodes, belonging to a particular row group and a particular column group has its first outgoing link connected to a first incoming link of another one of said nodes belonging to said particular row group, and has its second outgoing link connected to a second incoming link of another one of said nodes belonging to said particular column group; and

each of said row groups and each of said column groups are interconnected with only one of said nodes;

where

a first node, belonging to a first row group and to a first column group, has its first outgoing link connected to a first incoming link of a second node in said first row group;

said second node, belonging to said first row group and to a second column group, has its second outgoing link connected to a second incoming link of a third node in said second column;

said third node, belonging to said second column group and to a second row group, has its first outgoing link connectd to a first incoming link of a fourth node in said second row group; and

said fourth node, belonging to said second row group and said first column group, has its second outgoing link connected to the second incoming link of said first node.

4,797,883

ENCODING OR DECODING CIRCUIT FOR TIME DIVISION MULTIPLEX AND SIMULTANEOUS SIGNALS

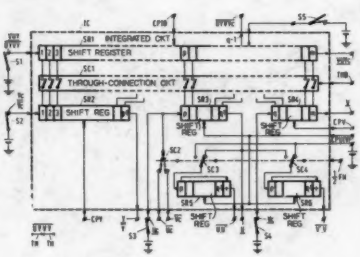
Uwe E. Kraus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,366

Claims priority, application Netherlands, Mar. 22, 1985, 8500841

Int. Cl.[4] H04J 3/00, 3/04; H04N 11/20

U.S. Cl. 370—109 **4 Claims**



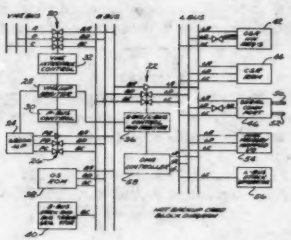
1. An encoding or decoding circuit for encoding from simultaneous signals to a time division multiplex signal or for decoding from the time division multiplex signal to the simultaneous signals, respectively, comprising a signal compression or expansion circuit, respectively, said compression or expansion circuit including at least three shift registers, each individual shift register having one of at least three different sets of write and read rates under the control of clock pulses of different frequencies, characterized in that said encoding or decoding circuit is constituted as an integrated circuit, said shift registers are suitable for both series-in, parallel-out and parallel-in, series-out operation, a first shift register having the largest number of register stages, which stages are coupled to parallel connections of at least a second and a third shift register via a through-connection circuit for parallel, bi-directional connection of the register stages of said first shift register to the other shift registers, the series inputs and series outputs of at least the first, second and third shift registers each being coupled to a separate connection terminal of the integrated circuit.

4,797,884

REDUNDANT DEVICE CONTROL UNIT

Charles I. Yalowitz, and Ronald D. Harris, both of Johnson City, Tenn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1986, Ser. No. 913,138
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 2 Claims
MICROFICHE APPENDIX INCLUDED
(30 Microfiche, 2870 Pages)



1. An industrial, digitally controlled processing system including two nominally identical electronic devices each operable in response to instructions from a control unit and to data derived from operations being performed by the processing system, each said electronic device being connected in the system in a manner such that one of the devices functions as an active device in the system regulating an operating sequence of the system including a plurality of specific, different system routines and

the other device functions as a standby device, each said electronic device comprising internal diagnostic means operative for diagnosing the operating status of said device and selecting means for placing said device in a condition to operate as an active device or a standby device, and each said electronic device comprising a back-up control unit comprising:

communications means including an optical fiber link for establishing communication between said device and the other nominally identical device;

control means connected to said communication means for determining whether said device is presently functioning as an active or standby device and for receiving, from said communication means, signals indicating whether the other nominally identical device is functioning as an active or a standby device;

synchronizing means connected to said communication means for synchronizing the operation of the device acting as an active device with that of the other nominally identical device acting as the standby device at selected limited points in the operating sequence of the system at which specific routines thereof are completed to maintain the nominally identical standby device substantially synchronized with the active device as the active device responds to data derived from operations being performed by the processing system; and

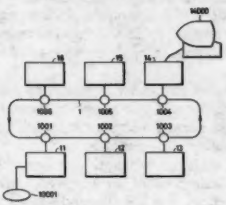
switching means connected to said communication means and responsive, when said device is functioning as the standby device, to the occurrence of a failure in the other nominally identical device during performance of a routine in the operating sequence of the system for causing said device to begin operating as the active device promptly after ending of said routine with improved synchronization relative to the operating sequence of the system.

4,797,885

DISTRIBUTED PROCESSING SYSTEM AND METHOD

Masayuki Orimo, Kawasaki; Kinji Mori, Yokohama; Yasuo Suzuki, Ebina; Minoru Koizumi, Yokohama; Katsumi Kawano, Fuchu; Hirokazu Kasajima, Hitachi, and Kozo Nakai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,495
Claims priority, application Japan, Dec. 11, 1985, 60-281418
Int. Cl.[4] G06F *11/22*
U.S. Cl. 371—19 8 Claims



1. Distributed processing method for a processing system including a plurality of processing means connected by a common transmission medium, comprising the steps of:

storing, in each processing means, information which represents whether or not a program to be executed therein is in a test mode;

when an executable program exists in a processing means, executing the program in said processing means on data received on said common transmission medium;

deciding in a processing means, on the basis of said stored information therein, whether or not a program executed therein is in a test mode;

producing test data in a processing means when it is decided that a program executed therein on data received on said common transmission medium is in a test mode; and

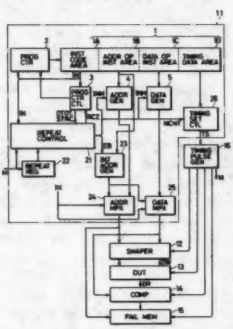
sending produced test data from said processing means to the common transmission medium so that the test data is received in at least one other one of said processing means.

4,797,886

MEMORY TEST PATTERN GENERATOR

Hideaki Imada, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,059
Claims priority, application Japan, Dec. 13, 1985, 60-280653
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 9 Claims



1. A memory test pattern generator for generating a test

pattern for a memory under test, the memory having internal address generating means and being capable of incrementing the internal address by merely supplying a clock signal, said memory test pattern generator comprising:

a program memory for storing instructions, each including an instruction code area for storing an instruction code and an internal address mode code, an address operation instruction area for storing an address operation instruction and an internal address operation instruction, a data operation instruction area for storing a data operation instruction, and a timing data area for storing timing data;

a program counter, operatively connected to said program memory, for producing program memory addresses in synchronization with operation clock signals to determine a program sequence, said program memory addresses being supplied to said program memory for accessing the instructions;

a program counter controller, operatively connected to said program counter and said program memory, for controlling, during a normal address mode, advancement of the program memory addresses in said program counter in accordance with the instruction code read out from the instruction code area of an accessed instruction in said program memory and for suspending, during an internal address mode, the advancement of the program memory addresses in said program counter by disregarding the instruction code when the internal address mode code indicating the internal address mode is read out from the instruction code area of the accessed instruction in said program memory;

an address generator, operatively connected to said program memory, for executing, during the normal address mode, an address operation in accordance with the address operation instruction read out from the address operation instruction area of the accessed instruction in said program memory to generate an address to be supplied to the memory under test, said address generator inhibiting the operation therein upon receipt of an inhibition signal during the internal address mode and outputting a previously produced address while the inhibition signal is received during the internal address mode;

data generating means, operatively connected to said program memory, for executing a data operation in accordance with the data operation instruction read out from the data operation instruction area of the accessed instruction in said program memory to generate one of write data and expected value data to be applied to the memory under test;

an internal address generator, operatively connected to said program memory, for executing, upon receipt of an internal address increment control signal during the internal address mode, an internal address operation in accordance with the internal address operation instruction read out from the address operation instruction area of the accessed instruction in said program memory to produce an internal address;

timing pulse generating means, operatively connected to said program memory and said program counter for generating, during the normal address mode, the operation clock signals in accordance with the timing data read out from the timing data area of the accessed instruction in said program memory and generating, during the internal address mode, the operation clock signals based on a timing reference signal applied thereto, the operation clock signals being supplied to said program counter;

repeat control means, operatively connected to said program memory, said program counter controller, said address generator, said internal address generator, and said timing pulse generating means, for generating, upon receipt of the internal address mode code from the accessed instruction in said program memory, the inhibition signal, the timing reference signal and the internal address increment control signal and for counting a predetermined number of the operation clock signals, said repeat control means producing, after counting the predetermined number of the operation clock signals, a release signal to be applied to said program counter controller for releasing the suspending of the advancement of the program memory addresses in said program counter; and

an address multiplexer, operatively connected to said internal address generator and said address generator, for outputting, during the normal address mode, the addresses from said address generator and for producing, during the internal address mode, a composite address by replacing predetermined bits of the previously produced address from said address generator with respective bits of the internal address from said internal address generator, the composite address corresponding to an address accessing the memory under test in the internal address mode.

4,797,887

SEQUENTIAL DECODING METHOD AND APPARATUS

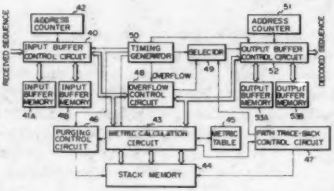
Norikazu Yamasaki, Tokyo, and Keiichiro Koga, Saitama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,517

Claims priority, application Japan, Nov. 1, 1985, 60-244105

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—43 **8 Claims**



5. A sequential decoding apparatus for decoding a received code word sequence which is convolutionally encoded, by determining a most likely path on a code tree referring to the received sequences, comprising:

input memory means for storing the received sequence;

stack memory means for storing nodes and their attributes which are provided by a calculation means;

said calculation means for extending paths along the code tree from one node, located at the top of the stack memory means, over plural tree levels at a time, calculating likelihoods of destination nodes at which the extension arrive referring to the received sequence, eliminating the node placed at the top of the stack memory means and then storing and reordering the destination nodes so that one of the nodes which have the largest likelihood may be placed at the top instead; and

tracking-back means for tracking-back from the node placed at the top of the stack at the final stage of decoding to a root node of the tree and then outputting one path leading therebetween as the decoded sequence.

4,797,888

CIRCUIT FOR THE PREIONIZATION AND MAIN DISCHARGE OF A PULSED GAS LASER

Peter Klopotek, Brookline, Mass., assignor to Lambda Physik, Gottingen, Fed. Rep. of Germany

Filed Jun. 23, 1987, Ser. No. 65,510

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3621005; Dec. 22, 1986, 3644004

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—38 **13 Claims**

1. A circuit for preionization and main plasma discharge of a pulsed gas laser comprising

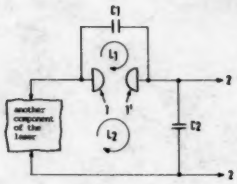
a supply circuit for supplying energy to a plasma discharge, transverse stimulation of a working gas by said plasma dis-

charge between main electrodes disposed in a chamber of said laser,

at least one spark electrode pair in the laser chamber,

a pulse voltage source for charging capacitive energy storage means, wherein

the capacitive energy storage means is connected low-inductively to a spark discharge taking place between the spark electrodes,



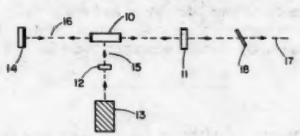
the capacitive energy storage means is charged by said pulse voltage source until a static breakdown voltage is achieved between the spark electrodes, thereafter a spark discharge takes place between the spark electrodes, in which the spark itself switches the energy stored in the low-inductively connected capacitive energy storage means.

4,797,889

SOLID STATE MOLECULAR LASER

Alexander Lempicki, Boston, Mass., assignor to Boston University, Boston, Mass.

Filed Jun. 24, 1987, Ser. No. 65,844
Int. Cl.[4] H01S *3/16, 3/17*
U.S. Cl. 372—39 **20 Claims**



1. A laser comprising:

a solid state lasing medium having a molecular emitting species such that an element of the molecular species has a closed shell configuration;

optical means for exciting the states of said species; and

an optical resonant cavity for oscillating coherent radiation emitted by the medium.

4,797,890

SEMICONDUCTOR LIGHT EMITTING DEVICE WITH VERTICAL LIGHT EMISSION

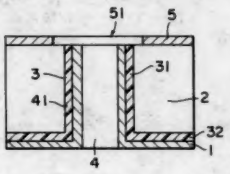
Fumio Inaba, 1-13-1, Yagiyama-minami; Hiromasa Ito, 390-82, Aza-aoba, Aramaki, both of Sendai-shi, Miyagi-ken; Noriaki Onodera, Sendai, and Akira Mizuyoshi, Amagasaki, all of Japan, assignors to Mitsubishi Cable Industries, Ltd.; Ricoh Company, Ltd.; Ricoh Research Institute of General Electronics; Fumio Inaba and Hiromasa Ito

Filed Dec. 24, 1986, Ser. No. 946,324
Claims priority, application Japan, Dec. 24, 1985, 60-291536; Jan. 10, 1986, 61-4032; Jan. 11, 1986, 61-2891
Int. Cl.[4] H01S *3/19*; H01L *33/00*; H01J *1/62*
U.S. Cl. 372—46 **24 Claims**

1. A light emitting device comprising:

a substrate having a first surface and a second surface which is opposite to said first surface, said substrate being provided with a through hole extending between said first and second surfaces;

an active area defined in said substrate as extending in parallel with a side wall of said through hole, said active area



generating light when current flows through said active area; and

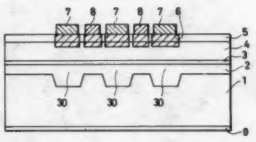
first and second electrodes formed on said substrate at opposite sides of said active area for passing current through said active area.

4,797,891

SEMICONDUCTOR LASER

Kazuhisa Uomi, Hachioji; Misuzu Yoshizawa; Yuichi Ono, both of Tokyo; Naoki Chinone, Hachioji, and Takashi Kajimura, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1986, Ser. No. 941,842
Claims priority, application Japan, Dec. 20, 1985, 60-285519
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **22 Claims**



1. A semiconductor laser device comprising:

a semiconductor substrate having at least two grooves formed therein and having a gap between each two grooves;

a plurality of semiconductor layers formed on said substrate over said grooves and said gap, including at least one semiconductor layer and an active layer, wherein said semiconductor layer is located between said substrate and said active layer;

diffused regions formed in said plurality of layers, to a depth less than the active layer;

a first electrode formed on said substrate opposite said plurality of layers; and

a plurality of second electrodes formed on said diffused regions,

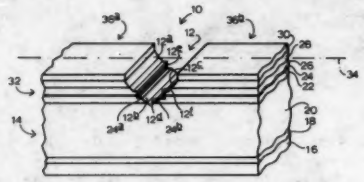
wherein a radiation angle of a laser emission beam generated by said semiconductor laser device is turnable by controlling current injection quantities into said second electrodes.

4,797,892

LONGITUDINALLY COUPLED SURFACE EMITTING SEMICONDUCTOR LASER ARRAY

Richard K. DeFreeze, Hillsboro; Richard A. Elliott, and Joseph Puretz, both of Beaverton, all of Oreg., assignors to Oregon Graduate Center, Beaverton, Oreg.

Filed May 11, 1987, Ser. No. 48,544
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—50 5 Claims



1. A coherent, surface emitting, semiconductor laser array in a monolithic wafer having an emission surface comprising:

at least one pair of adjacent, spaced semiconductor lasers, each laser including plural semiconductor layers which form an oscillator cavity generally in the plane of said wafer and each laser including electrode means for energizing said cavity to emit energy of a predefined wavelength from said cavity;

means for phase locking said pair; and

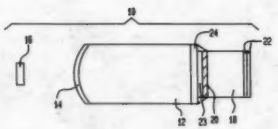
means for reflecting a portion of said energy generally normal to and away from said surface.

4,797,893

MICROLASER SYSTEM

George J. Dixon, Lutz, Fla., assignor to Virgo Optics, Inc., Port Richey, Fla.

Filed Jun. 9, 1987, Ser. No. 59,804
Int. Cl.[4] H01S 3/16, 3/082
U.S. Cl. 372—66 19 Claims



13. In a microlaser system in which a solid state rod useful as the gain medium is included in an optical cavity and supplied at one end with pumping light for the stimulated emission of light from the rod at its opposite end and the optical cavity includes a mode selector for limiting the number of axial modes at which the microlaser oscillates, the improvement wherein said

solid state rod comprises a homogeneously broadened gain medium, one end of said rob bains curved and including a coating highly transmissive of pumping light and highly reflective of the desired stimulated light, and the other end of which is planar and transmissive of the stimulated light,

a flat having one planar surface contiguous the planar end of the rod and the other surface coated with a reflector for providing a reflecting mirror that is partially transmissive of the stimulated light for passage therethrough,

a thin film of a material absorptive of the stimulated light positioned between the planar end of the rod and the said one planar surface of the flat, and

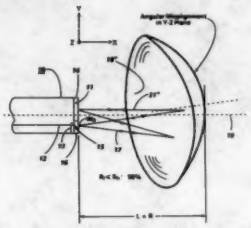
the axis of the gain medium rod being normal to the plane of the flat.

4,797,894

ALIGNMENT METHOD AND ARRANGEMENT FOR EXTERNAL OPTICAL FEEDBACK FOR SEMICONDUCTOR DIODE LASERS

Joseph Yaeli, Haifa, Israel, assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 21, 1987, Ser. No. 88,178
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—92 19 Claims



1. In a semiconductor diode laser having at least one output beam emitted from an emission aperture from a facet of said laser, external optical feedback means to redirect said output beam back into said laser emission aperture and comprising a reflective surface mirror on said facet laterally adjacent to said emission aperture and a spherical mirror spatial positioned from said laser facet to receive said output beam and image the same onto said facet mirror and reimage said beam reflected from said facet mirror back to said emission aperture.

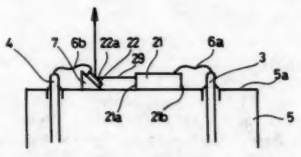
the improvement comprising said spherical mirror being spaced from the center of said facet a distance substantially equal to the center of curvature of said mirror so that the reimaging of said beam provides a spot size substantially equal to the spot size of said emission aperture, the alignment of said spherical mirror relative to said laser facet in directions laterally of and rotationally about said radius being insensitive to limited relative movement between said spherical mirror and said laser in said directions.

4,797,895

SEMICONDUCTOR LASER APPARATUS

Yoshihiro Kokubo, and Wataru Susaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,260
Claims priority, application Japan, Jul. 2, 1985, 60-147446
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—43 12 Claims



1. A semiconductor laser apparatus comprising:

a semiconductor laser chip including a resonator having a pair of oppositely disposed end faces, one of said endfaces having an antireflective coating and a second of said endfaces having a highly reflective coating;

a stem having a main surface onto which said chip is directly mounted with said pair of end faces being perpendicular to said main surface; and

a photoelectric conversion device, a major surface of which

absorbs a part of a laser beam emitted from said one end face, thereby to monitor intensity of said beam, and reflects the remaining part of said beam for practical use.

4,797,896

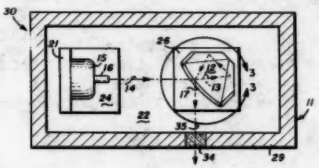
SOLID STATE OPTICAL RING RESONATOR AND LASER USING SAME

Thomas J. Kane, Palo Alto, Calif., assignor to Light Wave Electronics Co., Mountain View, Calif.

Continuation-in-part of Ser. No. 46,546, May 6, 1987, Pat. No. 4,749,842. This application Jul. 20, 1987, Ser. No. 75,565

Int. Cl.[4] H01S *3/083*

U.S. Cl. 372—94 **15 Claims**



1. In a solid state non-planar optical ring resonator:

a member of optically transparent monolithic lasant material;

reflecting means defined by a plurality of facets of said member of material for reflecting optical energy internal to said member around in a non-planar closed ray path within said member to define an optical ring resonator;

coupler means at least partially defined by a coupler one of said facets of said reflecting means for coupling optical energy into and out of said ring resonator and through said coupler facet along divergent input and output ray paths; and

said facets of said reflecting means being oriented with respect to each other such that a ray coupled by said coupler means into said resonator is coupled out of said resonator, after traversing at least one trip around said closed ray path, along an output ray path which is angularly separate from said input ray path by an angle ψ in excess of 45 degrees.

4,797,897

APPARATUS FOR CONTROLLING THE DISTANCE OF A MELTING ELECTRODE FROM THE SURFACE OF THE MELTED MATERIAL IN A VACUUM ARC FURNACE

Otto Stenzel, Gründau, and Friedrich-Werner Thomas, Gelnhausen, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

PCT No. PCT/DE87/00487, § 371 Date Aug. 10, 1987, § 102(e) Date Aug. 10, 1987, PCT Pub. No. WO87/03772, PCT Pub. Date Jun. 18, 1987

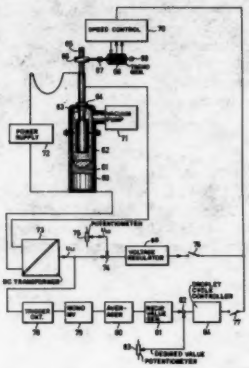
PCT Filed Nov. 29, 1986, Ser. No. 110,721

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544005

Int. Cl.[4] H05B *7/148*

U.S. Cl. 373—105 **11 Claims**

1. In apparatus for controlling the arc distance between a melting elctrode and the surface of melted material in a vacuum arc furnace, wherein the short-circuits caused by the droplets between the melting electrode and the surface of the melted material are used as a control criterion, said apparatus comprising means for determining the short-circuits occurring within a given period of time, the so-called droplet rate; an averager (80), coupled to said short circuit determining means, for averaging of said droplet rate; and controller means, coupled to said averager, for controlling said arc distance in dependence upon the average droplets rate; the improvement comprising reciprocal value forming means (81), coupled to said averager (80), for producing a signal representing the reciprocal value of the droplet rate signal produced by said averager; desired value forming means for producing a signal representative of the desired average time between to consecutive droplet short circuits; and means coupled to said reciprocal value forming means and to said desired value forming means, for producing a signal representative of the difference between said reciprocal value and said desired value, said controller means being responsive to said difference signal.



4,797,898

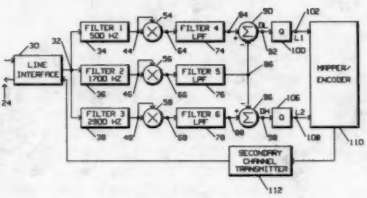
METHOD AND APPARATUS FOR EQUALIZATION OF DATA TRANSMISSION SYSTEM

Aldo A. Martinez, Miami, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Nov. 21, 1986, Ser. No. 933,654

Int. Cl.[4] H03H *3/40*; H04B *3/14*

U.S. Cl. 375—7 **17 Claims**



1. A data communication system, comprising:

a first and a second transceiver coupled together through a transmission

channel, said transmission channel having transmission characteristics;

said first transceiver including a first transmitter and a first receiver;

said second transceiver including a second transmitter and a second receiver;

said first transceiver comprising:

measurement means, coupled to said first receiver, for measuring the effects of said transmission characteristics upon a known training signal transmitted from said second transmitter, to said first receiver, said known training signal having predetermined spectral characteristics known to said first receiver;

mapping means coupled to said measurement means, for

mapping said measured transmission characteristics to a predetermined code; and

means for transmitting said code from said first transmitter to said second receiver;

said second transceiver comprising;

filtering means for providing a plurality of predetermined filter characteristics for use in filtering signals to be transmitted by said second transmitter; and

decoding means for receiving said code and for selecting an unique one of said predetermined filter characteristics corresponding to said transmitted code for use by said second transmitter.

4,797,899

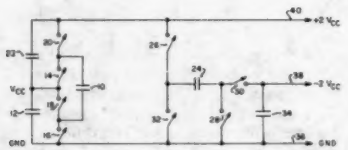
INTEGRATED DUAL CHARGE PUMP POWER SUPPLY INCLUDING POWER DOWN FEATURE AND RS-232 TRANSMITTER/RECEIVER

Roger W. Fuller, Scotts Valley, and David Bingham, San Jose, both of Calif., assignors to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Filed Dec. 15, 1986, Ser. No. 941,373

Int. Cl.[4] H04B 1/38; H02M 7/25

U.S. Cl. 375—7 **5 Claims**



1. A circuit, integrateable on a single piece of semiconductor substrate material, for providing a bipolar voltage output at substantially double the voltage of a unipolar voltage input source, including:

first and second voltage input terminals,

first and second positive transfer capacitor connection terminals,

a first set of semiconductor switches for selectively connecting said first voltage input terminal to said first positive transfer capacitor connection terminal and said second voltage input terminal to said second positive transfer capacitor connection terminal,

first and second positive reservoir capacitor connection terminals, said first positive reservoir capacitor connection terminal connected to said second voltaqe input terminal,

a second set of semiconductor switches for selectively connecting said first voltage input terminal to said second positive transfer capacitor connection terminal and said first positive transfer capacitor connection terminal to said second positive reservoir capacitor connection terminal,

first and second negative transfer capacitor connection terminals,

a third set of semiconductor switches for selectively connecting said first positive reservoir capacitor connection terminal to said first negative transfer capacitor connection terminal and said second positive reservoir capacitor connection terminal to said second negative transfer capacitor connection terminal,

first and second negative reservoir capacitor connection terminals, said first negative reservoir capacitor connection terminal connected to said first positive reservoir capacitor connection terminal,

a fourth set of semiconductor switches for selectively connecting said first negative transfer capacitor connection terminal to said second negative reservoir capacitor connection terminal and said second negative transfer capacitor connection terminal to said first negative reservoir capacitor connection terminal,

selection circuitry for selectively activating said first, second, third and fourth sets of semiconductor switches,

means for clamping said second positive reservoir capacitor connection terminal to a voltage approximately equal to the voltage appearing on said first voltage input terminal,

means for clamping said second negative reservoir capacitor connection terminal to a voltage approximately equal to the voltage appearing on said second voltage input terminal,

means for inhibiting latch-up of forward biased four layer devices created as a result of layout of said circuit on a single piece of semiconductor substrate material, and

means for selectively deactivating said selection circuitry such that selected ones of said first, second, third and fourth sets of semiconductor switches remain on while the remainder of said semiconductor switches remain off.

4,797,900

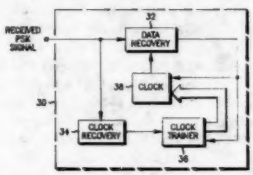
MODEM WITH IMPROVED CLOCK CONTROL AND METHOD THEREFOR

Steven L. Anderson, Huntsville, Ala., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1987, Ser. No. 91,489

Int. Cl.[4] H04L 5/16, 7/04

U.S. Cl. 375—8 **5 Claims**



1. An improved clock positioning method for modems which have pattern sensitivities comprising the steps of:

determining a normal clock phase position for the clock in said modem during initial training which precedes the transmission of data;

selecting a first set of data patterns which do not have substantial group delay relative to the normal clock phase position and a second set of data patterns which have substantial group delay relative to the normal clock phase position;

using the normal clock phase position upon the recovery of patterns in said first set;

using another clock phase position upon the recovery of a certain pattern in said second set, said another clock phase position being selected to provide phase compensation for the corresponding group delay of said certain pattern, thereby minimizing pattern sensitivities due to different group delays of the data patterns.

4,797,901

CIRCUIT ARRANGEMENT FOR TESTING A PASSIVE BUS NETWORK WITH THE CARRIER SENSE MULTIPLE ACCESS WITH COLLISIONS DETECTION METHOD

Jan Goerne; Joseph Kozilek, and Steven Moustakas, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 898,994

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530262

Int. Cl.[4] H04J 3/02

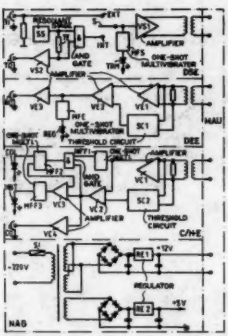
U.S. Cl. 375—10 **6 Claims**

1. A circuit arrangement for testing a passive bus network system which comprises a plurality of stations each connectible to a coaxial cable segment via a respective media adapter

unit, the stations operable for data packet exchange via the coaxial cable segment in accordance with the carrier sense multiple access with collision detection access method to detect a collision state and a heartbeat state, said circuit arrangement comprising:

a data transmitter including a first amplifier unit means comprising an output coupled DC free to the respective media adapter unit and an input, a data packet generator including a resonator and a trigger circuit connected to said resonator for generating data packets with a defined bit rate, an external data input for receiving data packets having an arbitrary data packet pulse sequence and an arbitrary bit rate, and a switch connected to said input of said first amplifier unit means and operable to selectively connect said data packet generator and said external data input to said first amplifier unit means;

a data receiver including a first amplifier means including an input coupled DC free to the respective media adapter and an output, second amplifier means including a first input connected to said output of said first amplifier means, a second input and an output, a data output, third amplifier means including an input connected to said output of said second amplifier means and an output connected to said data output, and a first threshold circuit including an input



connected DC free to the respective media adapter unit and an output connected to said second input of said second amplifier means and operable to suppress noise pulses; and

status receive means including first amplifying stage means including an input coupled DC free to the respective media adapter unit and an output, second amplifying stage means including a first input connected to said output of said first amplifying stage means, a second input and an output, a second threshold circuit including an input coupled DC free to respective media adapter unit and an output connected to said second input of said escond amplifying stage means and operable to suppress noise pulses; and

status receive means operable to monitor the data packet reception with respect to the collision state and the heartbeat state producing respective collision and heartbeat signals and further comprising a collision display device, a heartbeat display device, a collision output, a decision stage connected between said output of said first amplifying stage means and said output of said second amplifying stage means and said collision display device and heartbeat display device, and a third amplifying stage means including an input connected to said output of said second amplifying stage means and an output connected to said collision output.

4,797,902

DIGITAL SIGNAL TRANSMISSION DEVICE

Masayuki Nishiguchi, Tokyo, and Kenzo Akagiri, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

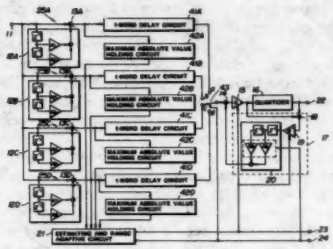
PCT No. PCT/JP85/00721, § 371 Date Aug. 29, 1986, § 102(e) Date Aug. 29, 1986, PCT Pub. No. WO86/04198, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 26, 1985, Ser. No. 905,391

Claims priority, application Japan, Dec. 29, 1984, 59-278501; Jul. 5, 1985, 60-147938

Int. Cl.[4] H04B *14/04*

U.S. Cl. 375—27 **6 Claims**



1. In a digital signal transmission device having means for forming serial input digital signals into a block after each predetermined number of words, the combination comprising;

a filter unit connected to receive said digital signals and adapted to obtain an estimated error for the signals of each block,

said filter unit consisting of a plurality of filters having a multiplier for multiplying one of a plurality of coefficients for adjusting the response of said filter,

means for comparing, with each other, the absolute values in the signals from said filters, and

means for selecting a filter that gives the smallest of said maximum absolute values and for connecting the signals from the selected filters to an output terminal, said connected signals forming said block.

4,797,903

CHANNEL SWITCHING SYSTEM WITHOUT INSTANTANEOUS SIGNAL LOSS

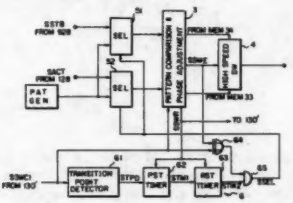
Hideaki Itoh, Chofu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 20, 1987, Ser. No. 51,640

Claims priority, application Japan, May 23, 1986, 61-118509

Int. Cl.[4] H04B *7/02*

U.S. Cl. 375—40 **18 Claims**



1. A channel switching system for a data communication system including, a standby transmission channel transmitter at a second end, and an active transmission channel having an active receiver at the first end, containing the channel switching system and a fault detector for detecting a fault and a

recovery of the active transmission channel, and an active transmitter at the second end, the standby transmitter at the second end being capable of transmitting a signal which is the same as that from the active transmitter at the second end, the fault and recovery detector detecting a fault or recovery of the active transmission channel in accordance with a signal output from the active or standby transmitter at the second end, said channel switching system comprising:

control means for generating a switching control signal in response to one of a fault and a recovery signal from said fault and recovery detecting means;

phase adjustment means, operatively connected to said control means, for receiving a signal from said active receiver and another signal from said standby receiver, for adjusting phase between both received signals in response to said switching control signal, and for outputing a switch energizing signal and two phase adjusted signals;

switch means, operatively connected to said phase adjustment means including a unipolar high speed switching circuit, for switching the two phase adjusted signals from said phase adjustment means in response to receiving said switch energizing signal; and

switching means, operatively connected to said phase adjustment means, for switching signals sent from said another end and supplied to said phase adjustment means in response to receiving said switching control signal,

said phase adjustment means adjusting a phase of one received signal to another phase of another received signal in response to receiving said switching control signal,

said phase adjustment means outputting said switch energizing signal to said unipolar switching circuit when a phase coincidence is obtained before a predetemined time lapse from an output of said switching control signal so that said unipolar switching circuit outputs the signal phase adjusted by said phase adjustment means in response to receiving said switch energizing signal,

said switching means energizing said unipolar switching circuit, when the phase coincidence is not obtained during said predetermined time, to output one signal of said phase adjusted signals in response to receiving said switch energizing signal.

4,797,904

TRANSMITTER FOR ISDN S-BUS INTERFACE CIRCUIT

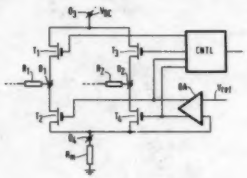
Hendrikus J. Dekker, and Johannes H. M. Velthof, both of Hilversum, Netherlands, assignors to AT&T and Philips Telecommunications B.V., Hilversum, Netherlands

Filed May 22, 1987, Ser. No. 53,231

Claims priority, application Netherlands, May 26, 1986, 8601331

Int. Cl.[4] H04L *27/00*

U.S. Cl. 375—60 **3 Claims**



1. A transmitter for an ISDN S-bus interface circuit for transmitting digital signals via a transmit line of a full-duplex four-wire line to one or a plurality of subscriber sets, which transmitter includes a bridge circuit formed by semiconductor switching elements each having a control input connected to a digital control circuit for cross-wise rendering selected ones of the switching elements conductive or non-conductive for transmitting a binary "zero" or rendering all the switching elements non-conductive for transmitting a binary "one", said bridge circuit including first and second transverse branches whose ends are connected between adjacent ones of said switching elements, said first transverse branch of the bridge circuit including the primary winding of a transformer to the secondary winding of which the transmit line is connected, said second transverse branch including a voltage source, characterized in that the second transverse branch includes a measuring resistor in series with said reference potential, that in addition the transmitter includes a differential amplifier a first input of which is maintained at a reference voltage and a second input of which is connected to said measuring resistor in said second transverse branch and a first output of which is connected to a control input of one of the switching elements and a second output of which is connected to a control input of one of the further switching elements for maintaining the current through the measuring resistor at a substantially constant value.

4,797,905

X-RAY GENERATOR INCORPORATING DOSE RATE CONTROL

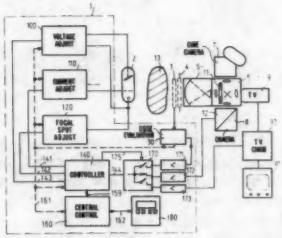
Rudolf Ochmann, and Robert H. Zimmermann, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,305

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600464

Int. Cl.[4] H05G *1/34*

U.S. Cl. 378—108 **3 Claims**



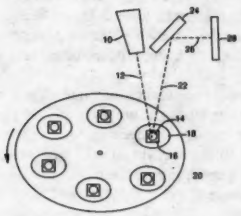
1. In an X-ray generator which includes adjustment means for at least X-ray tube current and X-ray tube voltage, controller means which act on the adjustment means in response to an actual value of X-ray dose rate and a reference value of X-ray dose rate, at least one measurement device for measuring the actual value of the X-ray dose rate, and a selection device which can be activated by an operator and which defines a type of X-ray examination as well as the reference value of the dose rate, the improvement wherein the controller means is a controller which controls the adjustment means during each of a series of sample intervals and includes a microprocessor, first memory means (148, 166) in which sampling frequency and the adjustment functions are stored for the various types of examination, and second memory means; and wherein, the controller calculates, in accordance with an adjustment function and a program stored in the second memory means (148, 166), adjustment values for each sampling interval and controls the adjustment means accordingly.

4,797,906

NONDESTRUCTIVE METHOD FOR ANALYZING TOTAL POROSITY OF THIN SECTIONS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 28, 1987, Ser. No. 101,880
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—44 6 Claims



1. A method for determining total porosity of a rock sample comprising:

stimulating an impregnated rock sample with X-ray electromagnetic radiation and detecting and measuring resulting X-ray fluorescence,

the rock sample having been impregnated with a fluid under conditions effective for introducing the fluid into both macropores and micropores, and

the fluid containing elements effective for fluorescing when stimulated by X-ray electromagnetic radiation;

stimulating a sample comprising only the fluid containing elements effective for fluorescing and detecting and measuring the resulting fluorescence; and

producing a measure of total effective porosity from the fluorescence resulting from the stimulated impregnated rock sample and fluorescence resulting from the sample comprising only the fluid.

4,797,907

BATTERY ENHANCED POWER GENERATION FOR MOBILE X-RAY MACHINE

Richard L. Anderton, West Jordan, Utah, assignor to Diasonics Inc., San Francisco, Calif.

Filed Aug. 7, 1987, Ser. No. 83,625
Int. Cl.[4] H05G *1/10*
U.S. Cl. 378—101 4 Claims

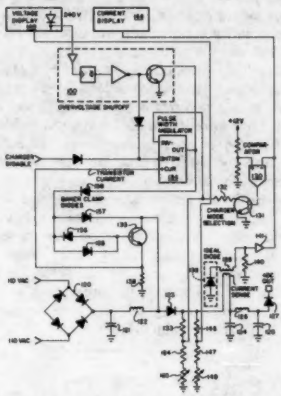
1. An apparatus having a X-ray emitter and a receptor for providing an image of a X-ray exposure, comprising: input coupling means for coupling said apparatus to an external power source.

a high-voltage generation means for generating voltage and current needed to generate X-rays for said X-ray exposure;

a battery coupled to said high-voltage generation means for providing battery electrical power to generate said voltage and current by said high-voltage generation means;

a charger coupled to said input coupling means, high-voltage generation means and battery for providing additional electrical power to said high-voltage generation means during periods of said X-ray exposure by converting said external power;

said charger recharging said battery during periods when said additional electrical power is not required by said high-voltage generation means; and



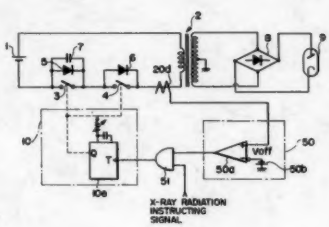
wherein a combination of said battery electrical power and said additional power provide for an improved image from said X-ray exposure.

4,797,908

VOLTAGE-RESONANCE TYPE POWER SUPPLY CIRCUIT FOR X-RAY TUBE

Shigeru Tanaka, Ootawara, and Fumio Ishiyama, Nishinasuno, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 6, 1985, Ser. No. 773,208
Claims priority, application Japan, Sep. 14, 1984, 59-194113; Sep. 14, 1984, 59-194114; Dec. 5, 1984, 59-258142
Int. Cl.[4] H02M *3/315;* H05G *1/12, 1/20, 1/32*
U.S. Cl. 378—105 6 Claims



1. A power supply circuit for supplying a high DC voltage between an anode and a cathode of an X-ray tube, comprising:

transformer means having a primary winding for connection to a DC source and a secondary winding;

rectifier circuit means coupled to said secondary winding of said transformer means for supplying the high DC voltage between said anode and said cathode of said X-ray tube;

first switching means;

a parallel combination of a capacitor and a first diode, connected in parallel with said first switching means, said capacitor forming a resonance circuit with said primary winding of said transformer means;

second switching means, series-connected with said first switching means;

a second diode connected in parallel with said second switching means;

said first switching means and said second switching means being connected in series with both said DC source and said primary winding of said transformer means, said first diode and second diode being connected across said first switching means and said second switching means respectively in polarity relationship opposite to the polarity of the DC source;

current detection means, coupled to said primary winding of said transformer means, for detecting when AC current flowing through said primary winding of the transformer means reaches a predetermined level and for detecting the end of a cycle of the resonance waveform of the AC current flowing through said primary winding of said transformer means; and

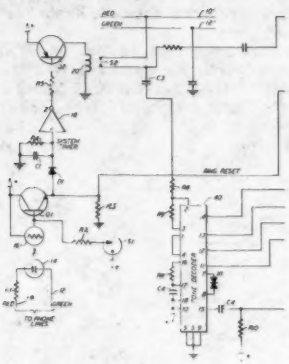
driving means for simultaneously driving said first and second switching means to turn on in response to the detection of the end of cycle of the resonance waveform of the current flowing through said primary winding of said transformer means by said current detection means and for turning off said first switching means at times when said AC current flowing through said primary winding reaches said predetermined level.

4,797,909

REMOTELY PROGRAMMABLE TELEPHONE ANSWERING SYSTEM WITH IMMEDIATE VERIFICATION UPON ENTRY

John F. Mastromoro, 3603 Brompton Ct., Liverpool, N.Y. 13090; Richard W. French, 609 Vine St., Liverpool, N.Y. 13088, and Samuel S. Strobert, 5892 Sutton Dr., Clay, N.Y. 13041

Filed Mar. 6, 1986, Ser. No. 836,768
Int. Cl.[4] H04M *1/64*
U.S. Cl. 379—67 **11 Claims**



1. An automatic telephone answering system for transmitting to a caller a message formed by a plurality of message segments, the sequency of the segments being pre-selected by a user through the keypad of either the local telephone to which the system is connected or any remote telephone in communication with the local telephone, a unique electrical signal being associated with each key on the telephone keypad, said system comprising:

(a) means for connecting said system to the incoming leads of a conventional, local telephone;

(b) a voice synthesizer containing a plurality of individual, pre-recorded message segments for transmission in a predetermined sequence determined by a series of electrical signal inputs to said synthesizer, each of said signal inputs being uniquely associated with a corresponding one of said message segments;

(c) a random access electronic memory device adapted to receive and store a sequence of said unique electrical signals from the individual keys of said keypad in the order pressed by the user, each of said unique electrical signals corresponding to a unique memory location of said memory device, and to generate said sequence of electrical signal inputs in response to a ring signal received at said local telephone;

(d) a tone decoder integrated circuit connected between said incoming leads and said memory device, and adapted to emit a binary coded signal corresponding to each of said electrical signals, said tone decoder being connected to said memory device by a plurality of separate lines, each corresponding to a digit position in said binary coded signal;

(e) circuit means connecting said memory device with said synthesizer for input to the latter of said signal inputs;

(f) means electrically connecting the output of said voice synthesizer to the speaker of said local telephone;

(g) means for generating a system reset pulse of short duration in response to a ring signal at said local telephone; and

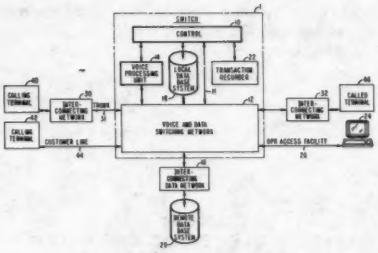
(h) a plurality of individual, integrated circuit, flip flop means to which said reset pulse is connected, including a write flip flop and an extended memory flip flop, each adapted to generate a clock pulse in response to said reset pulse.

4,797,910

AUTOMATED OPERATOR ASSISTANCE CALLS WITH VOICE PROCESSING

Abraham N. Daudelin, Colts Neck, N.J., assignor to American Telphone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 7, 1986, Ser. No. 860,651
Int. Cl.[4] H04M *3/38, 3/50, 3/56;* H04Q *3/70*
U.S. Cl. 379—67 **32 Claims**



1. In a telecommunications switch offering operator assistance services, a method of serving an operator assistance call, comprising the steps of:

connecting a calling customer terminal to an automatic voice processing system in response to a receipt of signals from a calling customer terminal identifying said call as an operator assistance call, said signals from said calling customer comprising signals specifying a directory number of a called customer terminal;

analyzing a voice command received from said calling customer terminal by said automatic voice processing system to identify the class of said operator assistance call;

generating and transmitting a request to an interconnection network to set up a connection from said telecommunications switch to said called customer terminal in response to said identification;

detecting an answer from said called customer terminal; and

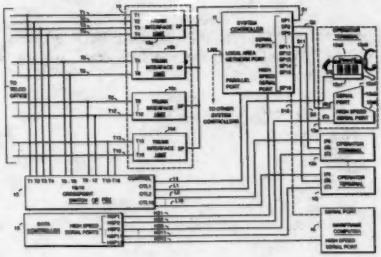
connecting said calling customer terminal to an operator position after said step of detecting an answer.

4,797,911

CUSTOMER ACCOUNT ONLINE SERVICING SYSTEM

Aleksander Szlam, Norcross; James W. Crooks, Jr., Marietta, both of Ga., and Curtis G. Marks, Minneapolis, Minn., assignors to Inventions, Inc., Norcross, Ga.

Filed Jun. 16, 1987, Ser. No. 62,944
Int. Cl.[4] H04M *1/274, 11/10*
U.S. Cl. 379—67 73 Claims



29. Apparatus for online updating of data on customer accounts contained in an information storage system, comprising:

dialing means for placing an outgoing call by dialing a telephone number on a telephone trunk;

call progress monitoring means connected to said telephone trunk for monitoring said telephone trunk and providing a status on said telephone trunk;

an operator terminal comprising a data terminal and an audio communications means;

trunk switching means for selectively connecting said telephone trunk to said audio communications means;

control means for obtaining said data on at least one said customer account from said information storage system, extracting a customer telephone number from said data for a selected said customer account, providing said customer telephone number to said dialing means monitoring said status of said telephone trunk and, if said outgoing call is answered, causing said trunk switching means to connect said telephone trunk to said audio communications means, and providing at least a predetermined portion of said data on said selected said customer account to said data terminal;

whereby said data terminal provides data entries made at said data terminal to said information storage system; and

said information storage system updates said data for said selected said customer account by incorporating said data entries into said data for said selected said customer account.

4,797,912

TELEPHONE ANSWERING DEVICE HAVING PUSHBUTTON CONTROLLED STANDBY MODE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,856
Claims priority, application Japan, Dec. 21, 1983, 58-241706
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—79 7 Claims

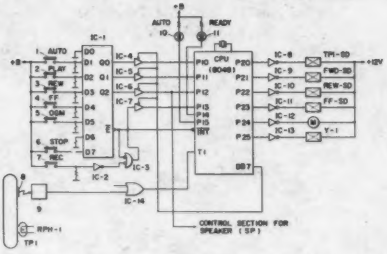
7. An automatic telephone answering and recording device operative in different operating modes and having a function button for selecting said modes, the device comprising:

means responsive to a receipt of a calling signal from a calling party for forming a closed circuit;

means for playing back a previously recorded outgoing message to the calling party;

means for recording incoming messages of the calling party; and

means for selecting among said different modes of operation of said device, including a microcomputer programmed to measure a time duration that said function button is



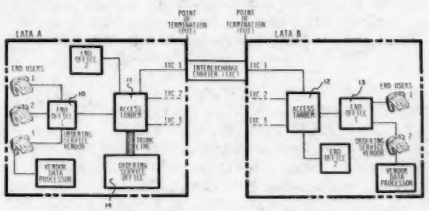
pushed and, in response to select a particular mode of operation.

4,797,913

DIRECT TELEPHONE DIAL ORDERING SERVICE

Murray Kaplan, Cherry Hill, and Robert W. Humes, Moorestown, both of N.J., assignors to Science Dynamics Corporation, Cherry Hill, N.J.

Filed Aug. 4, 1987, Ser. No. 81,670
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—91 12 Claims



1. A system providing for automated ordering of products or services by a calling customer by direct telephone dialing and providing customer, vendor and product identification for use within a Local Access and Transport Area (LATA) switching network having Feature Group D service utilizing the 15 digit domestic dialing plan with Feature Group D and interexchange carrier designations in the first 5 digits and providing Automatic Number identifications (ANI) for the calling customer comprising:

data processing means within the LATA assigned an interexchange carrier number and interconnected to the LATA switching network to receive calls at a point of termination as an interexchange carrier based upon the first 5 digit designation and wherein the data processing means is programmed to receive and process the final 10 digits of the 15 digit call for determination of variables such as vendor, product, grade and the like designations; and

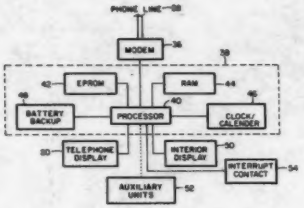
wherein the data processing means is further programmed to receive and process the ANI information,

4,797,914

TELEPHONE DISPLAY

Donald B. Vaello, San Antonio, Tex., assignor to North American Industries, Inc., San Antonio, Tex.

Filed Jun. 17, 1987, Ser. No. 64,315
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—96 **15 Claims**



11. A display unit for a telephone, comprising:

a primary display panel attached to a visible, exterior portion of said telephone;

a secondary display panel distant from said telephone;

a modem for receiving a character string transmitted over telephone lines, said modem located within said telephone, and said character string having one or more messages embedded therein;

a central processor connected to said modem and said primary and secondary display panels, for decoding a plurality of clock commands associated with said one or more messages embedded in said character string and displaying said one or more messages on said primary and secondary display panels continuously and repeatedly in a time-dependent mode;

an erasable, programmable read-only memory connected to said central processor for storing program instructions for said processor;

a random-access memory connected to said central processor for storing said character string; and

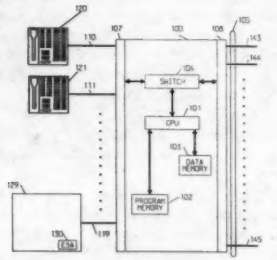
an electronic clock/calendar connected to said central processor for providing information on present time and day.

4,797,915

COMMUNICATION SYSTEM HAVING AUTOMATIC CALL ROUTE SELECTION

Duane O. Bowker, Neptune City; Adrian A. Giuliani, Aberdeen, and David F. Jones, Middletown, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Oct. 9, 1986, Ser. No. 917,202
Int. Cl.[4] H04M *3/42*
U.S. Cl. 379—216 **15 Claims**



1. A communication system comprising

a common control unit connected to a plurality of communication lines arranged in a plurality of line groups and connected via a communication loop to a station set which is assigned to use two or more of said plurality of line groups, said common control unit including

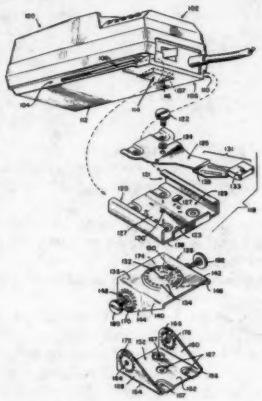
means responsive to called party dialing digits generated by said station set for selecting an individual one of said two or more of said plurality of line groups assigned to said station set as a function of said called party dialing digits and for selecting a line from the identified line group over which to place a call.

4,797,916

TELEPHONE HANDSET CRADLE MOUNTING

Kazuo Kojima, Tokyo, Japan, assignor to Uniden Corporation of America, Indianapolis, Ind.

Filed Nov. 13, 1987, Ser. No. 120,045
Int. Cl.[4] H04M *1/11, 1/12*; F16M *11/12*
U.S. Cl. 379—454 **5 Claims**



1. Apparatus for mounting a mobile telephone handset cradle from the interior of a vehicle or the like, the apparatus comprising a base for mounting from the interior of the vehicle or the like, means for mounting the cradle, and means for rotatably mounting the means for mounting the cradle to the base, the rotatable mounting means providing substantially 360° relative rotation between the means for mounting the cradle and the base, a mobile telephone handset cradle, one of the cradle and the means for mounting the cradle including means for providing a pair of grooves, the other of the cradle and the means for mounting the cradle including means for providing a pair of opposed tongues, the tongues proportioned for engagement with the grooves for attachment of the cradle to the means for mounting the cradle.

4,797,917

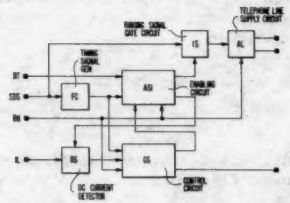
MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR SUPPLYING RINGING SIGNALS TO A SUBSCRIBER'S TELEPHONE LINE AND FOR DETECTING AN OFF THE HOOK CONDITION DURING RINGING

Mauro Pasetti, Milan, and Marco Siligoni, Vittuone (MI), both of Italy, assignors to SGS Microelettronica SpA, Milan, Italy

Filed Jul. 29, 1987, Ser. No. 79,157
Claims priority, application Italy, Jul. 29, 1986, 21284 A/86
Int. Cl.[4] H04M *3/06*
U.S. Cl. 379—253 **6 Claims**

1. A monolithically integratable telephone circuit for supplying ringing signals and for detecting an off the hook condition during ringing, and forming an interface between a subscriber's telephone line and a subscriber's line circuit under the control of exchange control components, comprises a circuit

means fof generating timing signals and a circuit means for supplying the telephone line, each having at least a first input terminal for connecting to exchange control components which generate a sinusoidal alternating signal having a frequency equal to the frequency of the ringing signal to be supplied to the line, said circuit means for generating timing signals generating a timing signal when an amplitude of a signal supplied to its first input terminal becomes zero during signal variations of the [signal]same kind, said circuit means for supplying the telephone line being coupled to said exchange control components, via a circuit means for supplying ringing signals having an enabling terminal, and also having an enabling terminal and a first and a second output terminal for connection to the terminals of the subscriber's telephone line; an enabling circuit means and a circuit means for controlling the detection of the off the hook condition each having at least a first and a second input terminal for connection to said circuit means for generating timing signals and to exchange components for generating control signals for supplying ringing signals to the line respectively, these exchange components being further connected to said enabling terminal of said circuit



means for supplying of the telephone line, said circuit means for controlling the detection of the off the hook condition further having at least a third input terminal for connection to the line via a circuit means for detecting a direct current on the line, said circuit means for detecting a direct current generating a signal when a direct current present on the line is greater than a predetermined current threshold, and having an enabling terminal, and at least a first and a second output terminal, said second output terminal being connected to exchange control components for receiving and processing signals indicating that an off the hook condition has taken place, said enabling circuit means further having at least a third input terminal for connection to exchange control components for generating control signals for causing a predetermined ringing rhythm, an inhibiting terminal connected to said first output terminal of the circuit means controlling the detection of the off the hook condition, and a first and a second output terminal connected respectively to said enabling terminal of said circuit means for supplying of ringing signals and to said enabling terminal of said circuit means for detecting of direct current on the line.

4,797,918
SUBSCRIPTION CONTROL FOR TELEVISION PROGRAMMING

Lin N. Lee, Potomac, and Neal D. Becker, Thurmont, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 608,671, May 9, 1984, abandoned. This application Apr. 15, 1987, Ser. No. 39,824

Int. Cl.[4] H04N 7/167, 7/10

U.S. Cl. 380—20 **17 Claims**

1. A method for one-way program subscription control for a plurality of program subscribers, each having a subscriber address, comprising the steps of:

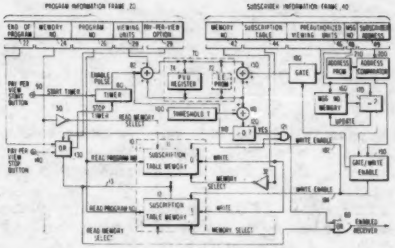
coding program identification information, including first memory address, program rate, and unique program number, according to preselected program characteristics;

concurrently transmitting said coded program identification information, repeated on a first periodic basis which period is substantially less than the duration of said coded program, and programming having said program characteristics to all program subscribers;

receiving and reading into a subscription table memory, being located at every subscriber address and being adapted to store an identification code for each progam, said coded program identification information;

coding individual program subscription information for each subscriber address, including second memory address, presubscribed program and credit information, according to programming selections made by such subscriber;

transmitting said program subscription information to all subscribers on a second periodic basis which period is substantially greater than the duration of said coded program;



receiving and writing said program subscription information into said subscription table memory at each subscriber address which corresponds to that subscriber address coded with said program subscription information being transmitted at a given time;

comparing said program identification information which has been read into said subscription table memory with said program subscription information which has been written in said subscription table memory;

enabling individual subscriber program receivers so that each said subscriber is able to receive programming then being transmitted in response to correspondence of said program subscription information and said program identification information, and decrementing said credit information stored in said subscription table memory on said first periodic basis when said comparison program identification information and said program subscription information results in said receiver being enabled.

4,797,919
RECEIVER HAVING AN INTERFACE WITH A SUB-SYSTEM

Bruce Murray, Wokingham, England; Louis Guillou, Bourgbarre, France, and Francoise M. R. Coutrot, Liffre, France, assignors to U.S. Philips Corporation, New York, N.Y.; Etablissement Public de Diffusion de France and Etat Francais, both of, France

Filed Nov. 25, 1986, Ser. No. 934,872

Claims priority, application United Kingdom, Nov. 25, 1985, 8529003

Int. Cl.[4] H04L 9/04

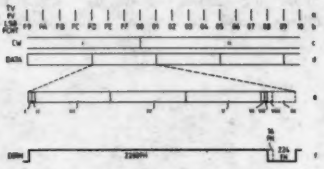
U.S. Cl. 380—20 **6 Claims**

4. A receiver having an interface arrangement for connection between said receiver and a conditional access sub-system and comprising a bus having a first line for conveying clock signals at television line frequency rate from said receiver to said sub-system, a second line for conveying data with a bit rate corresponding to that of the clock signal and with 8 bits per byte from said receiver to said sub-system during a first part of a bus cycle period and from said sub-system to said

receiver during the remaining part of said bus cycle period, and a third line for conveying a direction signal indicating to said sub-system the direction of data travel on said second line, the bus cycle period having a duration equal to four television frame periods, the data on said second line during the first part of each bus cycle period including sequentially:

i. an address block of 1 byte containing the unique address of the sub-system with which said receiver is in communication,

ii. a status block of 1 byte providing status information for the following and remaining individual blocks in the first part of the bus cycle period,



iii. three data blocks each of 93 bytes and each containing an entitlement message,

iv. a keying block of 1 byte conveying keyboard or remote control commands, and

v. a further block of either ½ byte or 2½ bytes conveying either the least significant bits of the frame count (4 bits) or the 256-frame count (20 bits),

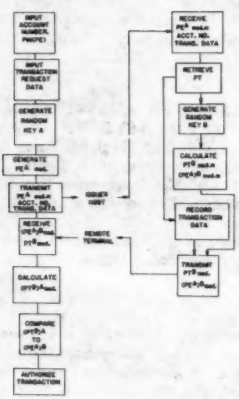
while the data on said second line during the second part of each bus cycle period comprises a data block of either 30 or 28 bytes, depending on the length of said further block, comprising information for said receiver from said sub-system.

4,797,920

ELECTRONIC FUNDS TRANSFER SYSTEM WITH MEANS FOR VERIFYING A PERSONAL IDENTIFICATION NUMBER WITHOUT PRE-ESTABLISHED SECRET KEYS

Theodore Stein, New Rochelle, N.Y., assignor to MasterCard International, Inc., New York, N.Y.

Filed May 1, 1987, Ser. No. 44,887
Int. Cl.[4] H04L 9/00; G07D 7/00
U.S. Cl. 380—24 **7 Claims**



1. A method of operating an electronic funds transfer of the type having at least one remote terminal and at least one issuer host terminal, comprising the steps of:

(a) accepting at the remote terminal account identification data and a personal identification number PE from a user;

(b) providing a first key A at the remote terminal;

(c) encrypting PE using encryption key A to derive A(PE);

(d) transmitting A(PE) to the host terminal;

(e) providing a second key B at the host terminal;

(f) encrypting A(PE) at the host terminal using encryption key B to derive B(A[PE]);

(g) providing at the host terminal the value of B(PT) which is the correct personal identification number PT encrypted using an encryption key B;

(h) transmitting B(A[PE]) and B(PT) from the host terminal to the remote terminal;

(i) encrypting B(PT) at the remote terminal using encryption key A to derive the value A(B[PT]);

(j) comparing the value of A(B[PT]) to B(A[PE]);

(k) executing an electronic funds transaction responsive to the values of A(B[PT]) and B(A[PE]) being the same;

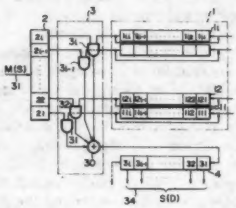
wherein each encrypting step is executed with the same algorithm, and wherein the algorithm effects a transformation such that, with two successive encryptions using two different keys the result is the same irrespective of the order of encryption.

4,797,921

SYSTEM FOR ENCIPHERING OR DECIPHERING DATA

Takayoshi Shiraishi, Chigasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,753
Claims priority, application Japan, Nov. 13, 1984, 59-239243; Dec. 26, 1984, 59-272909
Int. Cl.[4] H04K 1/00, 9/00
U.S. Cl. 380—28 **3 Claims**



1. A system for enciphering or deciphering i binary digit data comprising:

first store means for temporarily storing input data to be enciphered or deciphered;

second store means for storing a matrix formed by a plurality of streams of i binary digit random numbers, each stream corresponding to a respective digit of said first store means; and

output means for outputting a signal as encryption or decryption data for said input data, said signal being obtained by performing mod 2 addition of the streams of random numbers, among a plurality of streams stored in said second store means, which correspond to those digits of the input data store in said first store means and having a "1" bit, said addition operation being performed independently for each digit of said random numbers;

wherein said plurality fo streams of random numbers to be stored in said second store means respectively correspond to i element consecutive in power number and selected from the $(2^{1}-1)$ elements of an i order irreducible primitive polynomial in the Galois field $GF(2^{i})$.

4,797,922

METHOD OF, AND APPARATUS FOR, TRANSFORMING A DIGITAL DATA SEQUENCE INTO AN ENCODED FORM

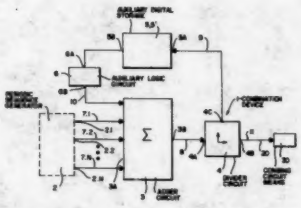
James L. Massey, Zürich, and Rainer A. Rueppel, Wetzikon, both of Switzerland, assignors to Borer Electronics AG, Biberist, Switzerland

Filed Oct. 28, 1985, Ser. No. 791,715

Claims priority, application Switzerland, Nov. 2, 1984, 05249/84

Int. Cl.[4] H04L 9/04

U.S. Cl. 380—46 18 Claims



1. Apparatus for generating a complex first pseudo-random digital sequence, said apparatus comprising:

(a) generating means for generating at least second and third periodic, pseudo-random digital sequences;

(b) summing means for receiving as inputs at least said second and third periodic, pseudo-random digital sequences and an auxiliary digital sequence for providing an output as a digital sum of said inputs, said digital sum output comprising a sequence of pluralities of bits, each of said pluralities of bits forming the integer sum of the corresponding bits of at least said second and third pseudo-random digital sequences and of said auxiliary digital sequence, each of said pluralities of bits comprising a selected one bit and the remaining bits, a sequence of said selected one bits forming said first pseudo-random digital sequence, and

(c) feedback means for receiving and feeding back said remaining bits as said auxiliary digital sequence to said summing means, whereby said first pseudo-random digital sequence is rendered more complex than said second and third pseudo-random digital sequences.

4,797,923

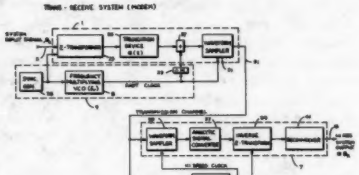
SUPER RESOLVING PARTIAL WAVE ANALYZER-TRANSCEIVER

William L. Clarke, 2221 Aralia St., Newport Beach, Calif. 92660

Filed Nov. 29, 1985, Ser. No. 802,980

Int. Cl.[4] G10L 1/00

U.S. Cl. 381—31 49 Claims



1. In a signal processing system having a system input, a signal transmission channel, and a system output, an improved apparatus for receiving a high resolution signal at the system input and recovering a corresponding high-resolution information signal at the system output, said apparatus comprising:

means for producing a summation of wave functions representing said input signal;

means for truncating said summation of wave functions to produce a corresponding summation of partial wave functions;

means for transmitting the truncated summation of partial wave functions through the signal transmission channel;

means for detecting the transmitted truncated summation of partial wave functions;

means responsive to said detecting means for producing a partial wave spectrum from the detected summation of partial wave functions; and

means for deconvolving said partial-wave spectrum to the values of said system input signal.

4,797,924

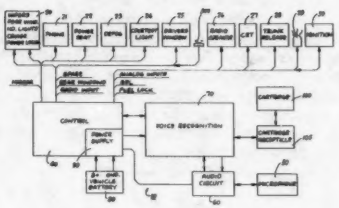
VEHICLE VOICE RECOGNITION METHOD AND APPARATUS

Michael J. Schnars, Haslett; Darrel A. Dolph, Big Rapids, both of Mich., and Yu-Jih Liu, Wharton, N.J., assignors to Nartron Corporation, Reed City, Mich.

Filed Oct. 25, 1985, Ser. No. 791,373

Int. Cl.[4] G10L 5/06

U.S. Cl. 381—43 4 Claims



1. A voice actuated system for controlling motor vehicle operations comprising:

a microphone mounted to the vehicle for converting speech from a vehicle operator into input signals representative of an operator enunciated command;

controller means for monitoring said input signals from the microphone, said controller means including a memory interface for accessing pre-recorded voice profile signals and comparing said pre-recorded voice profile signals with the input signals from the microphone,

an interchangeable memory module that can be coupled to the memory interface of the controller means for storing pre-recorded voice profile signals that are unique for a specific vehicle operator and that maintain said pre-recorded voice profile signals in memory whether or not the memory module is coupled to the memory interface; said memory module including a pre-recorded data representation of an operator pronunciation of one or more motor vehicle control commands, and

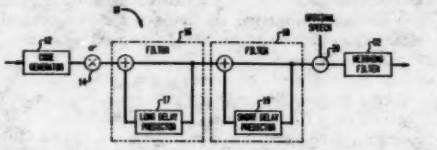
interface means responsive to control outputs from the controller means for activating one or more vehicle control operations in response to sensing of a correspondence between the input signal representation of the operator enunciated command and voice profile signals.

4,797,925

METHOD FOR CODING SPEECH AT LOW BIT RATES

Daniel Lin, Montville Township, Morris County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 26, 1986, Ser. No. 911,776
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—36 **8 Claims**



6. A method for coding and decoding a speech signal comprising the steps of,

dividing the speech signal into blocks, each block comprising a plurality of samples,

for each block of speech signal to be coded, generating a set of related code sequences, each succeeding code sequence being generated from the preceding code sequence by removing one or more elements from the beginning of and adding one or more elements to the end of the preceding sequence,

processing each code sequence by multiplying each code sequence by an amplitude factor and passing each sequence through at least one digital filter with time varying filter coefficients,

comparing each processed code sequence with the actual block of speech signal to be coded to determine which processed code sequence is closest to the actual block of speech signal,

transmitting to a receiver an identification number of the closest code sequence and information relating to said amplitude factor and filter coefficients, and

receiving said identification number and said information at said receiver, and in response thereto, regenerating said code sequence identified by said number, multiplying said regenerated code sequence by said amplitude factor and passing said regenerated code sequence through at least one digital filter whose filter coefficients are determined using said received information, thereby regenerating the coded speech signal.

4,797,926

DIGITAL SPEECH VOCODER

Edward C. Bronson, Lafayette, Ind.; Walter T. Hartwell, St. Charles, Ill.; Willem B. Kleijn, Batavia, Ill., and Dimitrios P. Prezas, Park Ridge, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 11, 1986, Ser. No. 906,523
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—36 **30 Claims**

1. A processing system for encoding human speech comprising:

means for segmenting the speech into a plurality of speech frames each having a predetermined number of evenly spaced samples of instantaneous amplitudes of speech;

means for calculating a set of speech parameter signals defining a vocal tract for each frame;

means for calculating frame energy per frame of the speech samples;

means for performing a spectral analysis of said speech samples of each frame to produce a spectrum for each frame;

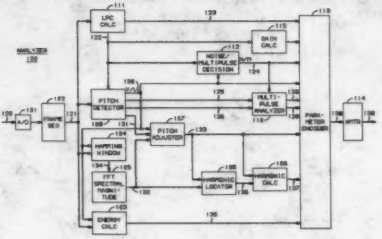
means for detecting the fundamental frequency signal for each frame from the spectrum corresponding to each frame;

means for determining harmonic freequency signals for each frame from the spectrum corresponding to each frame;

means for adjusting the detected fundamental frequency signal so that the harmonic frequency signals are evenly distributed around integer multiples of the adjusted fundamental frequency signal by analysis of peaks within said spectrum representing said fundamental and harmonic frequency signals;

means for determining offset signals representing the difference between each of said harmonic frequency signals and integer multiples of said fundamental frequency signal for each frame; and

means for transmitting encoded representations of said frame energy and said set of speech parameters and said fundamental frequency and said offset signals for subsequent speech synthesis.

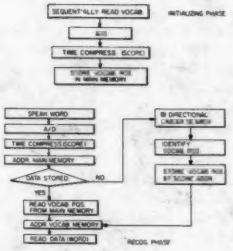


4,797,927

VOICE RECOGNITION PROCESS UTILIZING CONTENT ADDRESSABLE MEMORY

Scott Schaire, San Remo, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,994
Int. Cl.[4] G10L 5/06
U.S. Cl. 381—42 **10 Claims**



1. A voice recognition method comprising:

(a) an initializing phase including the steps:

converting a preset vocabulary list of spoken words to digitized form;

performing time compression of the digitized words to standardize the length of each word wherein the compressed word has a corresponding digital score;

formatting a main memory with addresses directly corresponding to each score, the data at each address being the position of the respective word in the vocabulary; and

(b) wherein the recognition phase includes the steps:

converting a spoken word to a digitized form;

performing time compression of the digitized word to standardize the length of each word wherein each compressed word has a corresponding digital score;

addressing the main memory at the location directly corresponding to the score;

reading out, from main memory, the position of the word in the vocabulary;

addressing a vocabulary memory at a memory location corresponding to the position of the word in the vocabulary; and

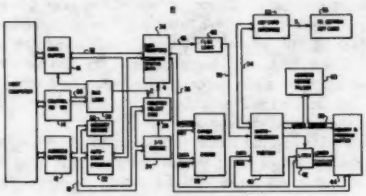
reading out a word stored at the vocabulary memory location, corresponding to the word spoken during the recognition phase.

4,797,928

ENCRYPTION PRINTED CIRCUIT BOARD

John Dykes, West Valley, Utah, assignor to MIU Automation, Salt Lake City, Utah

Filed Jan. 7, 1987, Ser. No. 1,206
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—49 9 Claims



1. An encryption/decryption apparatus for a host computer having expansion slots for an expander board comprising:

an expander board for connection to a host computer's expansion slot, said expander board including:

an address storage means, a control read/write means, and a data storage means for operative connection to a host computer, the address means for storing addresses for a block of data received from the host computer for ciphering and the read/write control means for receiving ciphering operational commands from the host computer including memory read, I/O read, I/O write, and enable control signals;

an auto-start means connected to the address storage means, control read/write means, and data storage means for coordinating the data addresses of the host computer with addresses for the expander board;

a register selector means connected to the auto-start memory means and to the control read/write means for outputting register selector signals;

a register means including a data input register connected to the control read/write means and data storage means and responsive to an I/O read enabling signal for storing the host computer's data for ciphering, a read/write command status register connected to the control read/write means and responsive to an I/O write signal for storing the host computer's command status signals, and a data output register connected to a microprocessor's enable terminal and data storage means and responsive to an enable signal for reveiving ciphered data; a cipher processor connected to the register means for receiving data for encryption or decryption selectively;

a microprocessor connected to the register means and to the cipher processor, the micropressor including an instruction means, and an instruction execution means for cycling through an I/O port read bus cycle, a memory-read bus cycle;

a data storage means connected to the cipher processor and to the microprocessor for storing the ciphered data output of the cipher processor; and

a key card interface means connected to the microprocessor, the key card interface means for connection to a key card reader for obtaining key information for the cipher processor;

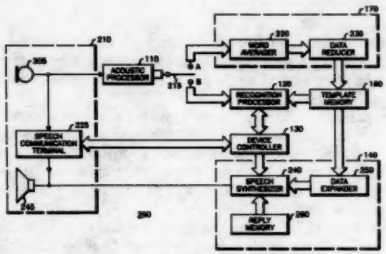
whereby the microprocessor upon command of the host processor fetches key information from the key card interface means for user authentication and cipher processor code selection and responsive to an authentication signal cycling through an I/O port read bus cycle each time an IN instruction is executed, a memory-read bus cycle for fetching instructions and data for ciphering by the cipher processor, and I/O port write bus cycle each time an OUT instruction is executed for writing data to a specific I/O port address in the I/O address space of the microprocessor storage means, and a memory-write bus cycle each time an instruction is executed to write data to a valid memory location.

4,797,929

WORD RECOGNITION IN A SPEECH RECOGNITION SYSTEM USING DATA REDUCED WORD TEMPLATES

Ira A. Gerson, Hoffman Estates; Brett L. Lindsley, and Philip J. Smanski, both of Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1986, Ser. No. 816,161
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—43 29 Claims



1. A method for processing speech information in a speech recognition system, wherein the information is represented by a sequence of frames, said speech recognition system being capable of comparing a given frame set to a template, and having template memory to store said template, said processing method comprising the steps of:

(a) combining contiguous acoustically similar frames of a previous frame set into representative frames to form a reduced template;

(b) storing said reduced template in template memory; and

(c) comparing frames of said given frame set to said representative frames of said reduced template according to the number of frames combined in said representative frames of said reduced template to produce a measure of similarity between the given frame set and the template.

4,797,930

CONSTRUCTED SYLLABLE PITCH PATTERNS FROM PHONOLOGICAL LINGUISTIC UNIT STRING DATA

Kathleen M. Goudie, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1983, Ser. No. 548,400
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—52 13 Claims

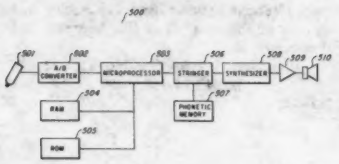
1. A speech producing apparatus comprising:

input means for receiving a sequence of input data, said sequence of input data including a first part containing a sequence of phonological linguistic unit indicia and a second part including primary stress indicia indicative of primary stress, secondary stress indicia indicative of secondary stress, base pitch indicia indicative of a base pitch and rise/fall indicia indicative of a rising or falling intonation;

control means connected to said input means for converting said sequence of input data into a sequence of speech synthesis control parameters including pitch control parameters for control of speech pitch by selection of one of a plurality of predetermined pitch patterns for each syllable grouping of phonological linguistic unit indicia in accordance with said second part of said sequence of input data, said control means including

phonemic memory means for storing speech synthesis parameters corresponding to each of said phonological linguistic unit indicia,

pitch parameter generating means for generating pitch parameters for syllable groupings of said sequence of phonological linguistic unit indicia dependent upon said second part of said sequence of input data,



recall means operably associated with said phonemic memory means for recalling speech synthesis parameters corresponding to said sequence of phonological linguistic unit indicia, and

concatenation means operably associated with said recall means and said pitch parameter generating means for combining said recalled speech synthesis parameters and said generated pitch parameters corresponding to syllable groupings of said sequence of phonological linguistic unit indicia; and

speech synthesis means connected to said control means for generating one or more audible words of human language corresponding to said speech synthesis control parameters.

4,797,931

AUDIO FREQUENCY SIGNAL IDENTIFICATION APPARATUS

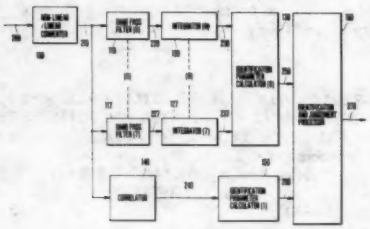
Yasuo Furukawa; Katsuyuki Yamazaki; Takemi Hosaka, and Akira Fukui, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd. and NEC Corporation, both of, Japan

Filed Feb. 26, 1987, Ser. No. 19,421

Claims priority, application Japan, Mar. 4, 1986, 61-47596

Int. Cl.[4] H04R *29/00*

U.S. Cl. 351—56 **4 Claims**



1. An audio frequency signal identification apparatus for identifying a signal type of an audio frequency signal presented in unit analysis times of multiplexed frames, comprising:

a correlator for calculating a full band power component first and second order autocorrelation coefficients of a digital audio frequency signal to be identified for each unit analysis time;

a plurality of band pass filters, provided for predetermined bands, for filtering the audio frequency signal to be identified in the respective bands;

a plurality of integrators, which are connected to said plurality of band pass filters in a one to one correspondence, for full wave rectifying and integrating the outputs from said band pass filters for the unit anlysis time so as to obtain individual band power components;

first identification parameter calculation means for calculating a maximum power component, a minimum power component, a frequency band F yielding the maximum power component, a bandwidth B, a difference between the individual band power component in the respective analysis times from the individual band power components output from said plurality of integrators;

second identification paramter calculation means for calculating a difference between two values of the first order autocorrelation coefficient outputted from said correlator for different unit analysis times, a difference between two values of the second order autocorrelation coefficient outputted from said correlator for the difference unit analysis times, and a difference between respective values of the first and second order autocorrelation coefficients for a same unit analysis time; and

identification and judgement processing means for judging a signal type of the audio frequency signal to be identified in accordance with which of a plurality of predetermined judgement conditions the identication parameters obtained from said first and second identification parameter calculation means and the full band power component of the digital audio frequency signal correspond and if they satisfy a condition of continuity.

4,797,932

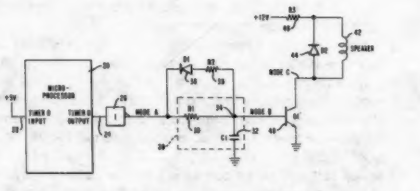
SPEAKER VOLUME CONTROL APPARATUS AND METHOD

John J. Rohulich, and John B. Keys, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 23, 1987, Ser. No. 124,329

Int. Cl.[4] H04N *7/04;* G01H *1/46;* G08B *3/00*

U.S. Cl. 381—104 **14 Claims**



9. A method for controlling the volume of a speaker comprising the following steps:

setting the maximum counts of first and second registers in a timer;

applying counting pulses to a counter which is controlled by first one and then the other of said registers to provide a repeating pulsed output signal from said timer having a first pulse width at one logic level representing the value stored in said one of said registers and a second pulse width at a second logic level representing the value stored in said other of said registers;

controlling the commencement and termination of operation of the counter to control said output signal;

buffering and inverting said output signal from said timer;

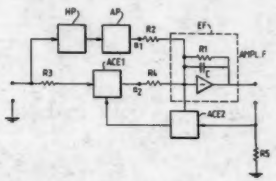
integrating the buffered and inverted signal;

applying said integrated signal to a signal translating device to control the on and off states of said signal translating device; and

applying an output of said signal translating device to a

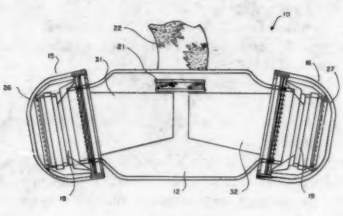
speaker to control the volume of a tone produced by said speaker.

4,797,933
BASS AMPLIFIER WITH HIGH FREQUENCY RESPONSE
Göran Hahne, Enbacken, Svia, Uppsala, Sweden S-755 90
Filed Mar. 2, 1987, Ser. No. 20,437
Claims priority, application Sweden, Mar. 20, 1986, 8601308
Int. Cl.[4] H04R *3/00*
U.S. Cl. 381—96 3 Claims



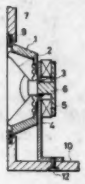
1. An amplifier comprising:
(a) an input port;
(b) an output port;
(c) a low-pass filter having a break-point frequency, connected to said input port, for producing low-pass signals at a phase;
(d) a power amplifying circuit connected to said low-pass filter for receiving said low-pass signals, and said output port;
(e) a current feed-back circuit, connected to said output port, said low-pass filter and said power amplifying circuit, for effecting an output port impedance which substantially consists of a negative resistance;
(f) a high-pass filter, connected to said input port, having a break-point frequency substantially equal to the break-point frequency of said low-pass filter, for producing a high-pass signal at a phase; and
(g) a phase shifting circuit, connected in series with said high-pass filter and further connected to said power amplifying circuit, for shifting the phase of said high-pass signals to substantially the same phase as the phase of said low-pass signals.

4,797,934
SPEAKER HEADREST
Fred M. Hufnagel, 11567 Ridge Rd., Nevada City, Calif. 95959
Filed Aug. 27, 1987, Ser. No. 90,122
Int. Cl.[4] H04R *1/02;* A47C *7/36, 7/38*
U.S. Cl. 381—188 6 Claims



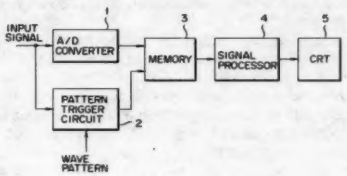
1. A speaker headrest comprising
a frame having a front surface for supporting a user's head, and
a pair of members flanking said frame, each of said flanking members having a housing structure containing speakers and a lever plate and being connected to said frame rotatably around an axis such that said flanking members swing around said axes to hold said speakers against the user's head as said lever plates are pushed toward said front surface of said frame.

4,797,935
SPEAKER SYSTEM WITH INDEPENDENTLY SUPPORTED TOP PLATE
Fujio Tanaka, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 24, 1987, Ser. No. 17,406
Claims priority, application Japan, Feb. 24, 1986, 61-24502[U]
Int. Cl.[4] H04R *1/02*
U.S. Cl. 381—205 4 Claims



1. A speaker system, comprising:
a cabinet having a baffle board facing a principal sound propagation direction and other wall members;
a voice coil passing a sound current therethrough;
a vibration plate to which said voice coil is attached;
a magnetic circuit interacting with said voice coil and including a top plate supporting said magnetic circuit and extending away from said magnetic circuit and connected to at least one of said other wall members but not to said baffle board;
a frame for supporting said vibration plate, said frame being fixed to said top plate; and
an elastic member disposed between said baffle board and said frame.

4,797,936
WAVEFORM SEQUENCE TRIGGER SYSTEM
Kenji Nakatsugawa, Kanagawa; Aiichi Katayama, Isehara; Hitoshi Sekiya, and Shoji Hiratsuka, both of Atsugi, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan
Continuation of Ser. No. 786,243, Oct. 9, 1985. This application Nov. 16, 1987, Ser. No. 120,729
Claims priority, application Japan, Oct. 15, 1984, 59-215861
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—1 10 Claims



1. A waveform sequence trigger system comprising:
comparing means for comparing an analog waveform input signal received with a predetermined threshold voltage to produce a serial analog signal having a high or low level;
sampling means, connected to said comparing means, for sampling said serial analog signal with a predetermined clock to produce a serial digital signal;
converting means, having serial shift registers of a predeter-

mined bit number connected to said sampling means, for storing a predetermined bit portion of said serial digital signal while shifting it for each bit in accordance with a predetermined clock, and for converting data of a predetermined bit portion stored in said serial shift registers to a parallel digital signal;

reference data setting means connected to said converting means, for presetting reference data corresponding to a waveform sequence of a desired time interval, to be triggered, of said analog waveform input signal received by the comparing means;

first determining means, connected to said converting means and said reference data setting means, for determining a coincidence between said parallel digital signal and said reference data, and for counting a coincidence bit number as a result of a determination to thereby generate data representing said coincidence bit number;

weight setting means for presetting a predetermined weighting coefficient associated with said coincidence bit number; and

second determining means, connected to said first determining means and said weight setting means, for comparing said data representing said coincidence bit number with said predetermined weighting coefficient, and for generating a waveform sequence triggering signal when said coincidence bit number is equal to, or greater than, said predetermined weighting coefficient.

4,797,937

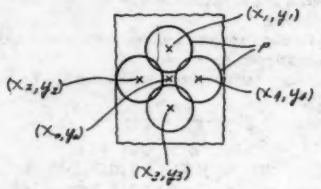
APPARATUS FOR IDENTIFYING POSTAGE STAMPS

Joji Tajima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 9, 1987, Ser. No. 59,934

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—1 **18 Claims**



1. An apparatus for identifying postage stamps, comprising:

scanning means for scanning a postage stamp to deliver color component signals having a level representative of intensity of respective color components;

means for calculating color distribution signals for respective color components by respectively convoluting said color component signals with weights determined in correspondence with a predetermined two-dimensional region;

a plurality of delay means for sequentially delaying said color distribution signals to produce a plurality of delayed color distribution signals, said plurality of delayed color distribution signals corresponding to color distribution signals of predetermined two-dimensional regions located at different positions at a generally central portion of the scanned postage stamp;

feature pattern extracting means for extracting a feature pattern corresponding to a color design of said scanned postage stamp, said feature pattern being a feature vector defined by at least three color distribution signals including said color distribution signals delivered from said calculating means and said plurality of delayed color distribution signals delivered from said plurality of delay means; and

identifying means for comparing said feature vector produced by said feature pattern extracting means with a prestored dictionary feature vector for each of a plurality of known stamps so as to identify said scanned postage stamp.

4,797,938

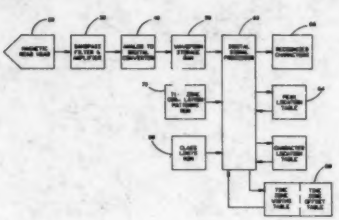
METHOD OF IDENTIFYING MAGNETIC INK (MICR) CHARACTERS

Terry A. Will, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 787,391, Oct. 15, 1985, abandoned. This application Mar. 31, 1988, Ser. No. 178,793

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—7 **8 Claims**



1. A method for identifying a character printed on a document comprising the steps of:

generating an analog signal representative of said character as the document passes a read element;

digitizing and storing values representing said analog signal for said character;

locating positive and negative peaks associated with said analog signal for said character;

testing the peaks associated with said character against a first plurality of repeating patterns, having different combinations of period and offset between positive and negative peaks, to determine which of said first plurality of repeating patterns best fit the peaks stored for said character;

using the one of said plurality of repeating patterns which best fits the peaks to select at least some of the stored digitized values and,

testing said selected stored digitized values against a second plurality of patterns representing the set of characters which can be identified, to identify the character.

4,797,939

PATTERN MASKING METHOD AND AN APPARATUS THEREFOR

Tetsuo Hoki; Tetsuo Sano; Ryuji Kitakado, all of Kyoto; Yoshinori Sezaki, Itami; Tomiji Hotta, and Hironobu Yano, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 2, 1986, Ser. No. 914,863

Claims priority, application Japan, Oct. 4, 1985, 60-222454; Jul. 5, 1986, 61-158458

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—8 **9 Claims**

1. A pattern masking method for masking through-hole patterns comprising:

an image data creating step of inputting binarized image data of an inspected object having through-holes in a time-series manner along a main scanning direction to sequentially create a binarized image data group for a plurality of pixels arrayed in a sub-scanning direction;

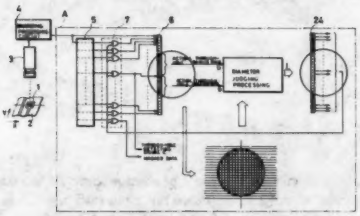
a pattern discriminating step of judging whether of not the pattern of an inputted image corresponds to a standard through-hole pattern on the basis of said sequentially created binarized image data group, said pattern discriminating step including:

a diameter measuring step of measuring through-hole diame-

ters on the basis of through-hole data continuous from a central pixel position of said binarized image data group created in said image data creating step along the sub-scanning direction,

an area judging step of calculating a through-hole area by sequentially cumulatively adding said measured through-hole diameters in order along the main scanning direction and comparing said calculated through-hole area with maximum and minimum allowable area values to judge whether or not said through-hole area is included in an allowable range, and

a diameter judging step of comparing measured through-hole diameters sequentially with maximum and minimum allowable diameters in order along the main scanning direction when said calculated through-hole area is judged to be within said allowable range to judge whether or nor said measured through-hole diameters are included



in said allowable range, thereby to judge that said pattern of said inputted image corresponds to said standard through-hole pattern when a determination is made that all of said measured through-hole diameters are within said allowable range;

a masking data creating step of sequentially creating through-hole diameter masking data, in order, along the main scanning direction when said pattern of said inputted image is judged to correspond to said standard through-hole pattern, said masking data creating step including a step of creating through-hole diameter masking data identical in diameter with said measured through-hole diameters; and

a masking processing step of sequentially performing masking processing on said binarized image data group of said inspected object arrayed in the sub-scanning direction on the basis of said through-hole masking data.

4,797,940

OPTICAL CHARACTER READER

Koji Sato; Masahiro Kurakake, and Kazuo Fujiwaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 2, 1987, Ser. No. 20,994

Claims priority, application Japan, Feb. 28, 1986, 61-41474

Int. Cl.[4] G06K *9/22, 9/34*

U.S. Cl. 382—9 **5 Claims**

1. An optical character reading comprising:

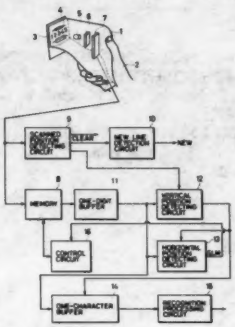
a hand-held image sensing means for simultaneously scanning a plurality of characters on a line of print and producing analog signals in response thereto that correspond to image elements sensed;

binary signal generating means for generating binary data responsive to said analog signals which are received from said image sensing means;

scanned position detecting means for determining whether the characters scanned were completely within the field of vision of said scanning means, said scanned position detecting means including means for truncating the binary data if said scanned position detecting means determines that some of the characters are not fully within the field of vision of the sensing means so that further processing of the truncated binary data does not occur and processing speed is increased;

memory means for storing said binary data;

one character pick out means for separating binary data from said memory means corresponding to n individual characters; and



recognition processing means for identifying the individual character separated by said pick out means, whereby an entire printed line of characters, N being a predetermined number of individual characters, may be scanned and identified without having to move the scanner from one character to another.

4,797,941

PATTERN DETECTION IN TWO DIMENSIONAL SIGNALS

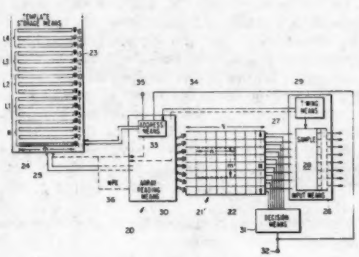
Peter G. Lloyd, 3 Apple Hill Road, Bale d'Urfé, Quebec, Canada H0X 3G5, and David A. Dudley, 7, Holmesdale Road, Sevenoaks, TN13 3XL, England

Filed Jul. 1, 1986, Ser. No. 880,995

Claims priority, application United Kingdom, Jul. 2, 1985, 8516867

Int. Cl.[4] G06K *9/64*

U.S. Cl. 382—27 **14 Claims**



1. A method of detecting a pattern feature in a two-dimensional electrical signal applied to a coordinate array of storage cells comprising, in a preliminary step, storing a plurality of template words, each template word being a plurality of storage cell address words, individual ones of which are associated with the individual values of one coordinate direction of the array and represent address values in the other coordinate direction, of cell locations coincident with a template, defining the pattern feature, mapped onto the array, and operationally applying a two-dimensional signal to said array of storage cells, extracting a stored template word addressing simultaneously a set of cells, one at each value of said one coordinate direction,

at address values of said other coordinate direction defined by the template word, reading the signal levels of the addressed cells, determining whether substantially all of the levels of the addressed cells are characteristic of the levels of a pattern feature template, and in response to a successful determination, providing an indication that the pattern feature has been detected in the two dimensional electrical signal.

4,797,942

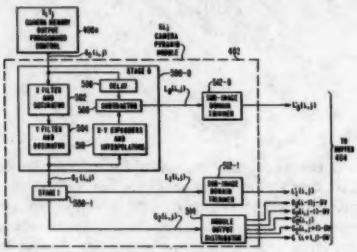
PYRAMID PROCESSOR FOR BUILDING LARGE-AREA, HIGH-RESOLUTION IMAGE BY PARTS

Peter J. Burt, Princeton, N.J., assignor to General Electric, Princeton, N.J.

Filed Mar. 2, 1987, Ser. No. 20,818

Int. Cl.[4] G06K 9/36

U.S. Cl. 382—41 19 Claims



1. A pyramid-processing method for deriving, substantially without the introduction of spurious spatial-frequency image artifacts, the spatial-frequency spectrum analysis of a single high-resolution image extending over the entirety of a relatively-large-area two dimensional field of view and comprised of pixels having a given pixel density; said deriving being done from an array of relatively-small-area, high resolution sub-images each of which also has said given pixel density and extends over a mutually exclusive two dimensional portion of said two dimensional field of view; said method comprising the steps of:

(a) pyramid-processing said array to derive a separate set of Laplacian-output pyramid levels $L'_0 \ldots L'_{K-1}$ lower than a certain pyramid level K, where K is a given positive integer, for each individual one of said sub-images, wherein Laplacian-output pyramid level L'_0 has said given pixel density and each Laplacian output pyramid level above L'_0 has a pixel density smaller than its immediately preceding Laplacian-output pyramid level;

(b) pyramid-processing said array to derive a single Gaussian-output pyramid level G_K for the entirety of said relatively large area, wherein said Gaussian-output pyramid level G_K has a pixel density which is smaller than the pixel density of said Laplacian-output pyramid level L'_{K-1}; and

(c) separately storing respective pixels of each separate set of Laplacian-output pyramid levels $L'_0 \ldots L'_{K-1}$ and respective pixels of said single Gaussian-output pyramid level G_K.

4,797,943

GRADATION DATA PROCESSING APPARATUS

Noboru Murayama, Machida, and Hiroshi Shimura, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 20, 1986, Ser. No. 933,021

Claims priority, application Japan, Nov. 29, 1985, 60-268927; Nov. 30, 1985, 60-270212

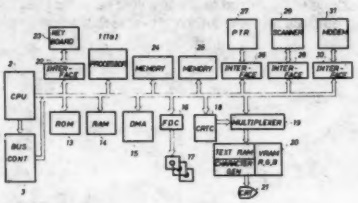
Int. Cl.[4] G06k 9/40

U.S. Cl. 382—54 13 Claims

1. A device for converting gradation data representative of the density level of a picture element of an original scanned image into extended gradation data for use in reproducing the original image, said original image being divided into an array of adjacent picture elements and being line-scanned from top to bottom, said device comprising:

first means for extracting (a) binary gradation data D comprised of a digital word of predetermined length and representative of a selected picture element, (b) binary gradation data Du representative of a pucture element located above and adjacent to said selected picture element, and (c) binary gradation data D1 representative of a picture element located immediately to the side of said selected picture element;

second means for executing the following calculations in



order to obtain a binary gradation date D' consisting of digital words having more bits than said gradation data D;

(a) $D'=2\cdot D+(Du+D1)$ when $T_2<\delta<T_1$;

(b) $D'=D_{max}$ when $T_1<\delta$; and

(c) $D'=D_{min}$ when $\delta<T_2$;

wherein $\delta=2\cdot D-(Du+D1)$, T_1 is a first predetermined threshold value, T_2 is a second predetermined threshold value smaller than T_1, D_{max} is a predetermined maximum gradation value, and D_{min} is a predetermined minimum gradation value; and

third means for delivering the calculated binary gradation data D' representative of the density level of the selected picture element as extended gradation data for use in reproducing the original image.

4,797,944

IMAGE SIGNAL ENCODING METHOD BY ORTHOGONAL TRANSFORMATION

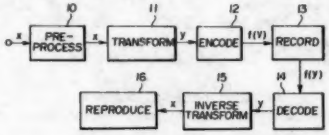
Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1987, Ser. No. 7,143

Claims priority, application Japan, Jan. 27, 1986, 61-15265; Mar. 17, 1986, 61-58803

Int. Cl.[4] G06K 9/44

U.S. Cl. 382—56 7 Claims



1. A method of image signal encoding by orthogonal transformation wherein the orthogonal transformation is conducted on each block of two-dimensional image signals on the basis of a predetermined orthogonal function, and the transformed signals obtained by the orthogonal transformation are put side by side in the order of sequency of said orthogonal function in the block and are respectively encoded with an intrinsic code length,

wherein the improvement comprises the steps of:

(i) predicting code length allocation suitable for a block

adjacent to said block, which has already been subjected to said encoding, on the basis of encoded signals and code length allocation in said block already subjected to said encoding, and

(ii) encoding respective transformed signals in said adjacent block in accordance with said predicted code length allocation.

4,797,945

IMAGE DATA CODING APPARATUS

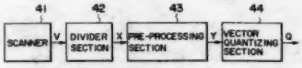
Yoshiyuki Suzuki, Kawasaki; Masahiro Funada, Yokohama; Mamoru Sato, Tokyo, and Yukio Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1986, Ser. No. 940,421

Claims priority, application Japan, Dec. 13, 1985, 60-281630; Dec. 13, 1985, 60-281640; Dec. 13, 1985, 60-281641

Int. Cl.[4] G06K 9/36, 9/46

U.S. Cl. 382—56 26 Claims



1. An image data coding method comprising the steps of:

dividing an image having gray levels into a plurality of blocks, each consisting of a plurality of pixels;

detecting a density and the presence/absence of an edge in each block; and

encoding an image of each block in accordance with the detected density and the presence/absence of the edge in the image.

4,797,946

INFORMATION RECORD/RETRIEVAL DEVICE

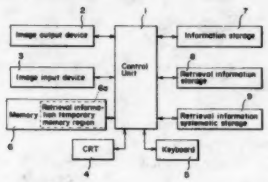
Yuji Katsuta, Yamatokoriyama; Sumio Kita; Sakuharu Takano, both of Nara, and Hiroshi Kamada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 11, 1986, Ser. No. 940,411

Claims priority, application Japan, Dec. 11, 1985, 60-278451; Dec. 11, 1985, 60-190678[U]

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—61 4 Claims



1. An information record/retrieval device for registering stored information according to retrieval data associated therewith and retrieving desired information by searching the retrieval data register in response to input retrieval data, comprising:

image input means for optically inputting information to be stored and coded retrieval data associated therewith;

information storage means for storing said information;

retrieval storage means for storing retrieval data associated with information stored in said information storage means;

retrieval systematic storage means for storing retrieval data corresponding to coded retrieval data;

image output means for outputting desired information;

display means for displaying input information and output information;

keyboard means for inputting retrieval data and commands for executing a registration operation or a retrieval operation;

memory means for receiving information from said image input means during said registration operation and from said information storage means during said retrieval operation, and for receiving retrieval data from said retrieval systematic storage means in response to the input of coded retrieval data during said registration operation and from said retrieval storage means during said retrieval operation; and

central processing unit (CPU) control means for matching stored information with input retrieval data during said retrieval operation and for transferring matched information from said information storage means to said memory means, controlling the output of matched information on said image output means from said memory means, and controlling the operation of information transfer among said image input means, memory means, information storage, retrieval storage, and retrieval systematic storage means.

4,797,947

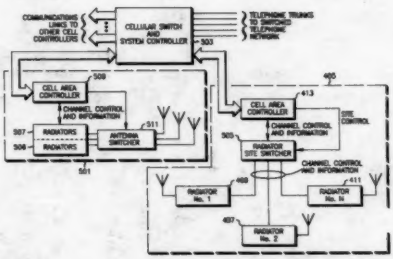
MICROCELLULAR COMMUNICATIONS SYSTEM USING MACRODIVERSITY

Gerald P. Labedz, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1987, Ser. No. 44,920

Int. Cl.[4] H04M 11/00; H04Q 7/00

U.S. Cl. 455—33 39 Claims



1. A communications system having a plurality of electromagnetic coverage areas created by electromagnetic radiators each radiator controlled by an area controller and serving a plurality of remote stations within each coverage area, comprising:

a first radiator transmitting a first electromagnetic signal during at least a first one of a plurality of time slots on a first electromagnetic frequency into at least a first portion of the electromagnetic coverage area;

a second radiator transmitting a second electromagnetic signal during at least a second one of said plurality of time slots on said first electromagnetic frequency into at least a first portion of the electromagnetic coverage area;

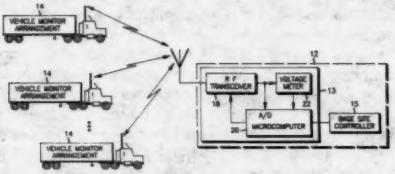
means at a remote station for selecting between said first and second electromagnetic signals and communicating said selection to the area controller; and

means at the area controller for selecting, in response to said communication of said selection between said first and second electromagnetic signals, a third one of said plurality of time slots on said first electromagnetic frequency for transmission of at least a portion of a first message to said remote station.

4,797,948
VEHICLE IDENTIFICATION TECHNIQUE FOR VEHICLE MONITORING SYSTEM EMPLOYING RF COMMUNICATION

Gary W. Milliorn, and Steven D. Bromley, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 22, 1987, Ser. No. 76,580
Int. Cl.[4] H04B 1/00; G08B 5/22
U.S. Cl. 455—54 16 Claims



1. In a communication system having a communication channel for transmitting data between a base station and a plurality of mobile units, wherein each unit has a unique identification (ID) code and wherein transmissions from each unit to the base station include the unit's ID code, a method for identifying which units are within communication proximity of the base station, comprising the steps of:

(a) transmitting a range message, including a low ID code parameter and a high ID code parameter, from the base station over the channel to elicit a response from any mobile units having an ID code between said low and high ID code parameters;

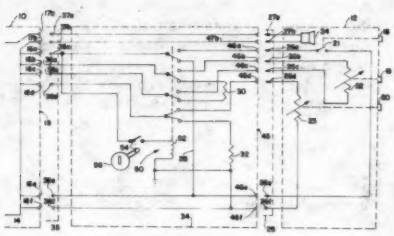
(b) determining whether any of said units transmitted a message in response to said range message; and

(c) storing, at the base unit and responsive to said transmission by any of said units, a signal representative of the respective ID code parameter assigned to such transmitting units.

4,797,949
SUPERVISORY CONTROL OF MOBILE TELECOMMUNICATIONS

George M. Stites, III, Hopatcong, N.J., assignor to G. M. Holding Corp., Sparta, N.J.

Filed May 1, 1986, Ser. No. 857,943
Int. Cl.[4] H04B 1/06, 1/10
U.S. Cl. 455—230 11 Claims

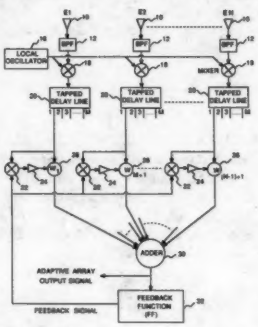


1. A method of providing supervision to prevent operator-induced disruption of a telecommunication system including a mobile unit having operator-adjustable controls for altering operating parameters of said mobile unit which control receipt of messages by said mobile unit, the method comprising the steps of disabling said operator adjustable controls and fixing said operating parameters of said mobile unit which control receipt of messages by said mobile unit to maintain the mobile unit in operation for receipt of messages despite attempted adjustment of said operator-adjustable controls.

4,797,950
MULTIPATH REDUCTION SYSTEM

Kenneth Rilling, 1190 Crestline Dr., Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 928,839, Nov. 10, 1986, Pat. No. 4,736,460. This application Oct. 2, 1987, Ser. No. 103,939
Int. Cl.[4] H04B 7/08
U.S. Cl. 455—276 22 Claims



1. A signal processing system for reducing distortion effects in communication receivers due to multipath, said system comprising:

adaptive array means having:

at least two antenna elements;

weighting means coupled to the antenna elements for selectively weighting the received signals by a selected weight factor; and

summing means for adding together the signals from the weighting means for generating an adaptive array output signal;

envelope detector means coupled to receive said adaptive array output signal for generating the amplitude envelope of said adaptive array output signal; and

first multiplier means coupled to receive the envelope detector means output signal and coupled to receive the adaptive array output signal for generating a feedback signal;

said adaptive array means also including a second multiplier means for each weighting means coupled to receive the feedback signal and coupled to receive the corresponding weighting means input signal, the output signal of which is coupled to a corresponding integrator means whose output signal is coupled to the corresponding weighting means for automatically redefining the weight factors.

4,797,951

PARALLEL OPTICAL DATA TRANSMISSION SYSTEM

Colin M. Duxbury, Woodley, and Raymond Yates, Manchester, both of Great Britain, assignors to International Computers Limited, London, England

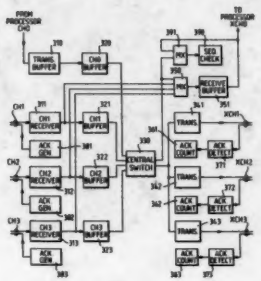
Filed Oct. 20, 1986, Ser. No. 921,216

Claims priority, application United Kingdom, Nov. 23, 1985, 8528890

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—608 9 Claims

1. Data transmission apparatus comprising a transmitter, a receiver and a plurality of optical fibres interconnecting the transmitter and receiver, the transmitter comprising means for transmitting messages as a sequence of groups of data bits, the bits of each group being transmitted in parallel over the fibres, each fibre carrying a signal encoded by means of a self-clocking code and means for preceding each message by a serial start pattern transmitted on each fibre, and the receiver comprising a plurality of decoder circuits for extracting separate clock and data signals from respective ones of said fibres, a plurality of start pattern detection circuits for independently detecting start patterns on respective ones of said fibres, a plurality of data buffers into which extracted data signals comprising the message body are clocked asynchronously by respective ones of said clock signals, and means for reading out the contents of



all the buffers in parallel when start patterns have been detected on all the fibres.

DESIGNS

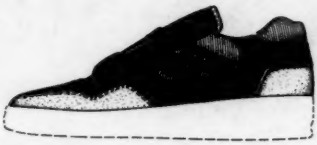
JANUARY 10, 1989

299,280
COSTUME
Sam B. Williams, P.O. Box 200, Walled Lake, Mich. 48088
Filed Feb. 13, 1986, Ser. No. 833,800
Term of patent 14 years
U.S. Cl. D2—30

299,281
COMBINATION SHIRT AND BOW TIE
Trevor I. Baptiste, 383 Grand Ave., Brooklyn, N.Y. 11238
Continuation-in-part of Ser. No. 739,814, May 31, 1985, Pat. No. Des. 295,227. This application Nov. 2, 1987, Ser. No. 115,187
Term of patent 14 years
U.S. Cl. D2—209

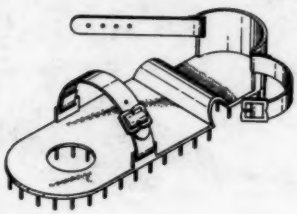
299,282
SHOULDER BIB
Brandi Winans, 1337 48th Ave., NE., St. Petersburg, Fla. 33703
Filed Mar. 24, 1986, Ser. No. 845,756
Term of patent 14 years
U.S. Cl. D2—226

299,283
SHOE UPPER
Lawrence Selbiger, Portland, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Feb. 17, 1988, Ser. No. 156,551
Term of patent 14 years
U.S. Cl. D2—314

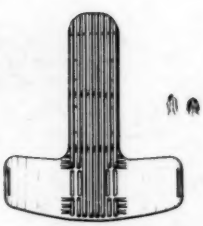


299,284
ATHLETIC SHOE UPPER
Paul D. Brown, Hingham, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok Group International Ltd., Canton, Mass.
Filed Dec. 2, 1986, Ser. No. 937,128
Term of patent 14 years
U.S. Cl. D2—314

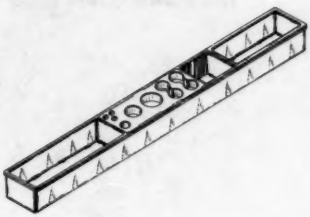
299,285
ICE GRIPPING SHOE ATTACHMENT
Derrick Watson, P.O. Box 27, Rison, Ark. 71665
Filed Jan. 23, 1986, Ser. No. 821,815
Term of patent 14 years
U.S. Cl. D2—317



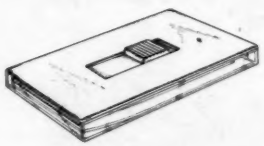
299,286
DIVER'S BUOYANCY COMPENSATOR BACKPACK SUPPORT
Mark Faulconer, Costa Mesa, and Scott E. Greatrake, Fountain Valley, both of Calif., assignors to U.S. Divers Company, Inc., Santa Ana, Calif.
Filed Aug. 26, 1985, Ser. No. 769,126
Term of patent 14 years
U.S. Cl. D3—32



299,287
TRUCK CAB STORAGE COMPARTMENT
Bernard H. Gertler, 117 35th St., Newport Beach, Calif. 92663
Filed Sep. 26, 1985, Ser. No. 780,175
Term of patent 14 years
U.S. Cl. D3—40

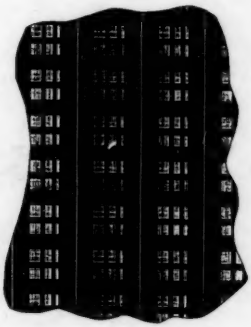


299,288
BUSINESS CARD DISPENSER
David A. Stafford, 2751 N. Harbor Dr., Maineville, Ohio 45039
Filed Dec. 9, 1985, Ser. No. 806,372
Term of patent 14 years
U.S. Cl. D3—56

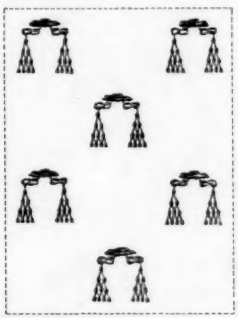


299,289
PUSH BROOM
Robert W. Machacek, Villa Park, Ill., assignor to The Drackett Company, Cincinnati, Ohio
Filed Apr. 22, 1986, Ser. No. 857,566
Term of patent 14 years
U.S. Cl. D4—134

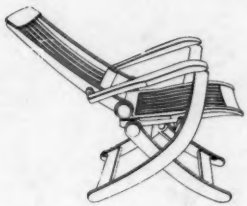
299,290
FLORIST FOIL OR SIMILAR ARTICLE
Dona L. Abbott, Boulder, Colo., assignor to Highland Supply Corporation, Highland, Ill.
Filed Aug. 9, 1985, Ser. No. 764,087
Term of patent 14 years
U.S. Cl. D5—46



299,291
TEXTILE FABRIC
Giancarlo Utili, Via Faentina Nord, 27, 48026 Russi (Ravenna), Italy
Filed Nov. 6, 1985, Ser. No. 804,001
Term of patent 14 years
U.S. Cl. D5—61

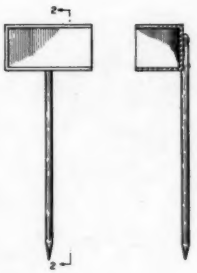


299,292
ADJUSTABLE ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex S.A.R.L., Oyonnax, France
Filed Mar. 28, 1986, Ser. No. 847,047
Claims priority, application France, Sep. 30, 1985, 854546
Term of patent 14 years
U.S. Cl. D6—367

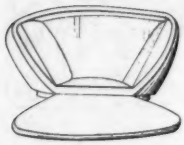


299,293
CHAIR FRAME
Jonathan M. Nelson, 36 Butler St., Kingston, Pa. 18704
Filed Apr. 9, 1986, Ser. No. 851,356
Term of patent 14 years
U.S. Cl. D6—372

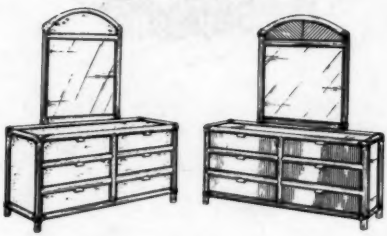
299,294
GARDEN TELEPHONE STAND
Arduino Paci, Box 360, R.D. #1, Rices Landing, Pa. 14357
Filed Jan. 6, 1986, Ser. No. 816,223
Term of patent 14 years
U.S. Cl. D6—417



299,295
CHEST
Patrick Diehl, 17 Rue des Dames, 10300 Sainte-Savine, France
Filed Mar. 31, 1986, Ser. No. 846,345
Claims priority, application France, Oct. 4, 1985, 85 4627
Term of patent 14 years
U.S. Cl. D6—434

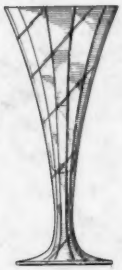


299,296
COMBINED DRESSER AND MIRROR
Bruce C. Lafko, 5126 Alta Canyada Blvd., La Canada, Calif. 91011
Filed May 5, 1986, Ser. No. 859,763
Term of patent 14 years
U.S. Cl. D6—444



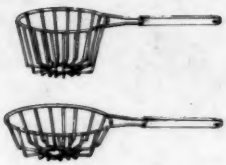
299,297
PRONE/SUPINE PILLOW
Howard Prager, 140 Wagon Wheel Rd., Sparta, N.J. 07871
Filed Jul. 14, 1986, Ser. No. 885,277
Term of patent 14 years
U.S. Cl. D6—601

299,298
WINE GLASS OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Jan. 8, 1986, Ser. No. 817,243
Term of patent 14 years
U.S. Cl. D7—11

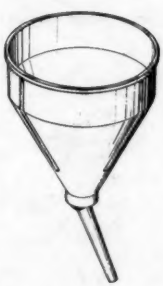


299,299
STEMMED WINE GLASS OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Nov. 13, 1985, Ser. No. 804,992
The portion of the term of this patent subsequent to Jan. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

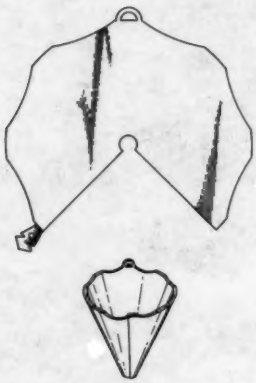
299,300
TORTILLA BASKET FRYER
Gunnar Lie, 6306 215th St. SW., Mountlake Terrace, Wash. 98043
Filed Feb. 19, 1986, Ser. No. 834,464
Term of patent 14 years
U.S. Cl. D7—43



299,301
FUNNEL
Steven E. Wirth, Bloomington, Minn., assignor to The Worthington Trust, Minneapolis, Minn.
Filed Jan. 10, 1986, Ser. No. 817,600
Term of patent 14 years
U.S. Cl. D7—68



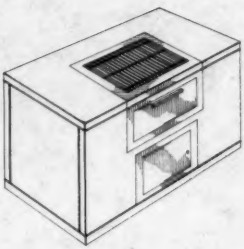
299,302
DISPOSABLE FUNNEL
Stephen W. Gray, 8835 Tobias Ave. #27, Panorama City, Calif. 91402
Filed Aug. 14, 1986, Ser. No. 896,251
Term of patent 14 years
U.S. Cl. D7—68



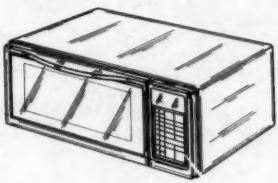
299,303
COMBINATION KITCHEN TOOL
Lucille C. Strobel, and Gerald E. Strobel, both of 120 Ocean Cove Dr., Jupiter, Fla. 33477
Filed May 1, 1986, Ser. No. 858,517
Term of patent 14 years
U.S. Cl. D7—104

299,304
ESPRESSO MACHINE
Michael Knöchner, Offenbach am Main, and Manfred Lang, Wuppertal, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany
Filed Mar. 12, 1986, Ser. No. 842,874
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 5MR10625
Term of patent 14 years
U.S. Cl. D7—309

299,305
BARBEQUE GRILL
Jack B. Vollborn, 1841 E. Palmcroft Dr., Tempe, Ariz. 85282
Filed Mar. 6, 1986, Ser. No. 842,005
Term of patent 14 years
U.S. Cl. D7—332

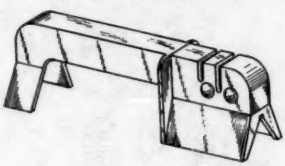


299,306
MICROWAVE OVEN
Kenzo Yoshida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 20, 1986, Ser. No. 922,111
Claims priority, application Japan, Apr. 22, 1986, 61-15406
Term of patent 14 years
U.S. Cl. D7—351



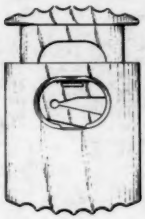
299,307
TOMATO PLANT SUPPORT TIE FOR ATTACHMENT TO A STAKE
Fred D. Finnigan, 4501 W. 23rd, Little Rock, Ark. 72204
Filed Nov. 7, 1986, Ser. No. 928,117
Term of patent 14 years
U.S. Cl. D8—1

299,308
KNIFE SHARPENER
William A. Prindle, Santa Barbara, Calif., assignor to Corning Glass Works, Corning, N.Y.
Filed Sep. 28, 1987, Ser. No. 101,769
Term of patent 14 years
U.S. Cl. D8—93

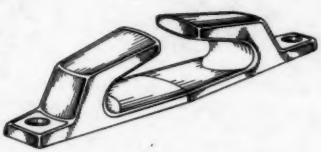


299,309
SELF-SANITIZING DOOR HANDLE
Richard L. Brookes, 841 W. Boston, Detroit, Mich. 48202
Filed Feb. 7, 1986, Ser. No. 827,047
Term of patent 14 years
U.S. Cl. D8—300

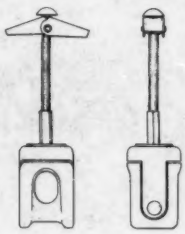
299,310
CORD LOCK
Gerhard Fildan, D-7250 Leonberg, Fed. Rep. of Germany
Filed May 16, 1986, Ser. No. 864,956
Term of patent 14 years
U.S. Cl. D8—356



299,311
CHOCK FOR BOATS
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Apr. 21, 1986, Ser. No. 857,424
Term of patent 14 years
U.S. Cl. D8—356



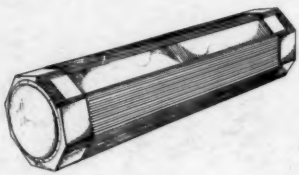
299,312
COMBINED HOOK AND BOLT THEREFOR
William B. Laessle, Royal Oak, Mich., assignor to Ernest Eugene Green, Sterling Heights, Mich., a part interest
Filed Jul. 14, 1986, Ser. No. 885,545
Term of patent 14 years
U.S. Cl. D8—367



299,313
SHOWER CURTAIN HOLDER OR SIMILAR ARTICLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jan. 27, 1986, Ser. No. 822,546
Term of patent 14 years
U.S. Cl. D8—373

299,314
BOTTLE OR SIMILAR ARTICLE
Louis B. LeFevre, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.
Filed Dec. 23, 1985, Ser. No. 812,695
The portion of the term of this patent subsequent to May 3, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—370

299,315
PACKAGING CONTAINER
Thomas J. Kasanda, Ottawa, Canada, assignor to Keepsakes Time Capsules, Inc., Ottawa, Canada
Filed Aug. 19, 1985, Ser. No. 766,789
Claims priority, application Canada, Jun. 19, 1985, 19-06-85-6
Term of patent 14 years
U.S. Cl. D9—398



299,316
CLOCK
Dana L. Vickery, Gardner, Mass., assignor to Simplex Time Recorder Co., Gardner, Mass.
Filed Jan. 10, 1986, Ser. No. 817,710
Term of patent 14 years
U.S. Cl. D10—15

299,317
LEVEL
Dennis F. Dahle, 1127 SW. Spruce St., Palm City, Fla. 33490
Filed Apr. 14, 1986, Ser. No. 852,497
Term of patent 14 years
U.S. Cl. D10—69

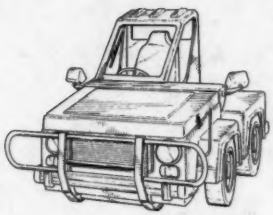
299,318
ALTERNATING CURRENT SENSING DEVICE
John A. Chiang, 113 Belvedere Ct., Walnut Creet, Calif. 94598
Filed Jul. 25, 1986, Ser. No. 889,480
Term of patent 14 years
U.S. Cl. D10—78

299,319
VASE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 42,005
Term of patent 14 years
U.S. Cl. D11—153

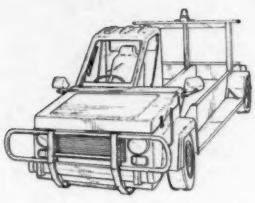
299,320
VASE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 41,914
Term of patent 14 years
U.S. Cl. D11—153

299,321
INSECT FIGURINE
Leal Smith, 4931 E. 40th, Indianapolis, Ind. 46226
Division of Ser. No. 4,696, Jan. 20, 1987, Pat. No. Des. 295,616, which is a division of Ser. No. 684,362, Dec. 20, 1984, Pat. No. Des. 289,270. This application Jan. 13, 1988, Ser. No. 143,152
Term of patent 14 years
U.S. Cl. D11—158

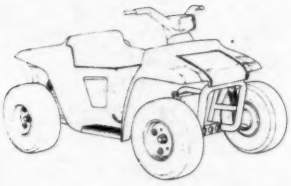
299,322
TOWING VEHICLE
Robert Page, 71 Dwyer Avenue, Little Bay, N.S.W. 2036, Australia
Filed May 9, 1986, Ser. No. 862,402
Term of patent 14 years
U.S. Cl. D12—14



299,323
TOWING VEHICLE
Robert Page, 71 Dwyer Avenue, Little Bay, N.S.W. 2036, Australia
Filed May 9, 1986, Ser. No. 862,403
Term of patent 14 years
U.S. Cl. D12—14

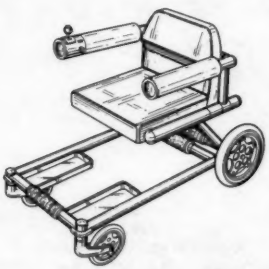


299,324
FOUR WHEELED VEHICLE
Yasuhiro Oba, Iruma; Mitsuru Yamamoto, Fujimi, and Akira Watanabe, Setagaya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1986, Ser. No. 850,378
Claims priority, application Japan, Oct. 14, 1985, 60-42939
Term of patent 14 years
U.S. Cl. D12—86

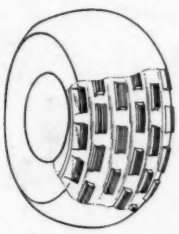


299,325
AUTOMOBILE
Toshi Oshika, Wako; Kazuhiro Ichinose, Shinjuku, and Yukio Kurosu, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 5, 1985, Ser. No. 741,673
Claims priority, application Japan, Jan. 23, 1985, 60-1947
Term of patent 14 years
U.S. Cl. D12—92

299,326
WHEELCHAIR
Lawrence A. Bernstein, 6456 Surfside Way, Malibu, Calif. 90265
Filed Oct. 30, 1986, Ser. No. 925,136
Term of patent 14 years
U.S. Cl. D12—131

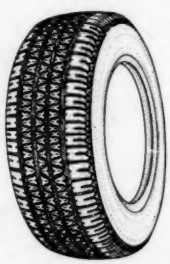


299,327
VEHICLE TIRE
Glynne D. Miller, Pickerington, Ohio, assignor to Kenda Rubber Industrial Co., Ltd., Yuanlin, Taiwan
Filed Mar. 31, 1986, Ser. No. 847,566
Term of patent 14 years
U.S. Cl. D12—140

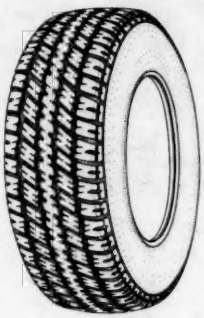


299,328
TIRE
William W. Lyle, Massillon, and Donald J. Sladky, Cuyahoga Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jul. 21, 1986, Ser. No. 887,681
Term of patent 14 years
U.S. Cl. D12—146

299,329
TIRE
Bill J. Wallet, Marshallville, and Ronald I. Clunk, Monroe Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Oct. 20, 1986, Ser. No. 921,017
Term of patent 14 years
U.S. Cl. D12—146

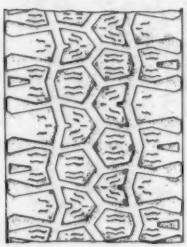


299,330
TIRE
Bill J. Wallet, Marshallville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 12, 1986, Ser. No. 873,639
Term of patent 14 years
U.S. Cl. D12—147

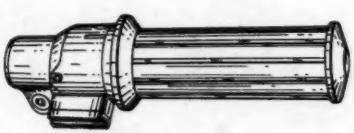


299,331
TIRE
Bill J. Wallet, Marshallville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 12, 1986, Ser. No. 873,563
Term of patent 14 years
U.S. Cl. D12—147

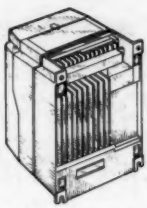
299,332
TIRE TREAD SURFACE PATTERN
Fredinando Carretta, Santo Andre Sao Paulo, Brazil, assignor to Pirelli S.A. Companhia Industrial Brasileira, Sao Paulo, Brazil
Filed Aug. 30, 1985, Ser. No. 771,067
Claims priority, application Brazil, Mar. 5, 1985, MI 4500176
Term of patent 14 years
U.S. Cl. D12—147



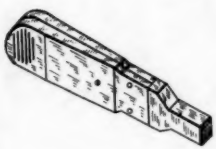
299,333
DERAILLEUR ACTUATING HANDLE UNIT
Maurice E. L. Cose, Feucherolles, France, assignor to Huret et ses Fils, S.A. of Chepy, Fesquieres en Vimeu, France
Filed Jun. 27, 1985, Ser. No. 749,874
Claims priority, application France, Dec. 27, 1984, 84 5832
Term of patent 14 years
U.S. Cl. D12—179



299,334
POWER INVERTER
Nobuyuki Kondo; Yoshinori Abe, both of Kamakura; Hideaki Tata, Nagoya; Eiji Ito, Nagoya; Katsuhiko Chonan, Nagoya, and Hideo Iinuma, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1985, Ser. No. 740,323
Claims priority, application Japan, Dec. 3, 1984, 59-49660; Dec. 3, 1984, 59-49662; Dec. 3, 1984, 59-49663; Dec. 3, 1984, 59-49664
Term of patent 14 years
U.S. Cl. D13—4



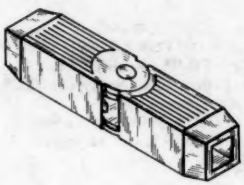
299,335
MICROPHONE
Christopher D. Wiegel, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.
Filed Nov. 24, 1986, Ser. No. 934,127
Term of patent 14 years
U.S. Cl. D14—225



299,336
HAND MICROPHONE FOR TRANSCRIBER
Akira Osanai, Hachioji; Toshikazu Kato, Hino, and Yasuo Hattori, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Sep. 26, 1986, Ser. No. 912,811
Term of patent 14 years
U.S. Cl. D14—225

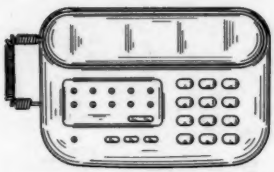
299,337
HEADSET
Christopher D. Wiegel, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.
Filed Nov. 24, 1986, Ser. No. 934,123
Term of patent 14 years
U.S. Cl. D14—206

299,338
MICROPHONE BOOM HINGE
Christopher D. Wiegel, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.
Filed Nov. 24, 1986, Ser. No. 934,129
Term of patent 14 years
U.S. Cl. D14—229

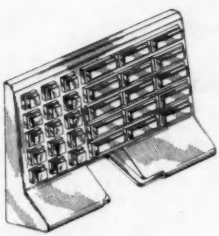


299,339
DIGITAL DIRECTORY
Joseph E. Wilson, 1106 Transcontinental Dr., Metarie, La. 70001
Filed May 22, 1985, Ser. No. 736,957
Term of patent 14 years
U.S. Cl. D14—241

299,340
TELEPHONE
Nobuyuki Tani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,742
Claims priority, application Japan, May 27, 1987, 62-21031
Term of patent 14 years
U.S. Cl. D14—150



299,341
HOUSING FOR A KEY PAD, CARRIER SELECT AND CREDIT CARD BEZEL FOR COIN TELEPHONES
Gerald J. Yachabach, Lakeland, Fla., assignor to Protel, Inc., Lakeland, Fla.
Filed May 8, 1987, Ser. No. 47,068
Term of patent 14 years
U.S. Cl. D14—247



299,342

HANDSET TRANSCEIVER AND TELEPHONE DIALER STAND WITH DISPLAY PANEL

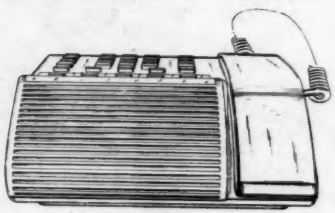
Karl Buchin, Berlin, Fed. Rep. of Germany, assignor to Krone AG, Berlin, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,306

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 95-MR5668NZ

Term of patent 14 years

U.S. Cl. D14—151



299,343

TELEPHONE COMMUNICATION TERMINAL SET

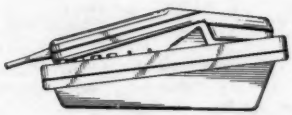
Georg Friedrich, Kassel, Fed. Rep. of Germany, assignor to Deutsche Telephonwerke und Kabelindustrie Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed May 27, 1987, Ser. No. 54,663

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 95MR5700NZ

Term of patent 14 years

U.S. Cl. D14—151



299,344

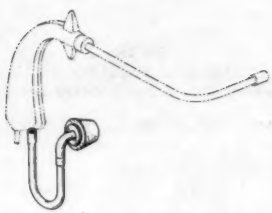
FOAM EAR CUSHION FOR TELEPHONE HEADSET OR SIMILAR ARTICLE

Toni R. Stevens, Felton, Calif., assignor to ACS Communications, Inc., Scotts Valley, Calif.

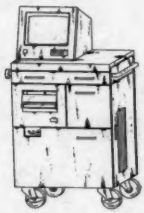
Filed Oct. 1, 1986, Ser. No. 913,961

Term of patent 14 years

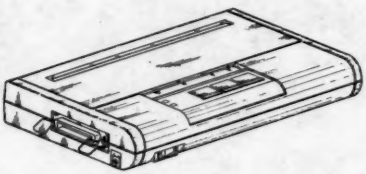
U.S. Cl. D14—249



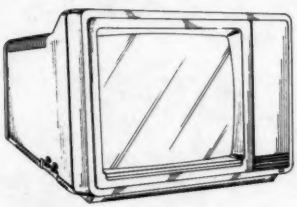
299,345
AUTOMOTIVE TEST TERMINAL
Hunter T. Foy, and Randall W. Martin, both of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Jan. 17, 1986, Ser. No. 819,662
Term of patent 14 years
U.S. Cl. D14—102



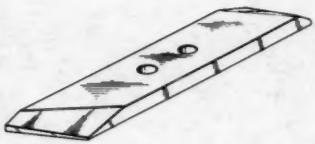
299,346
PRINTER FOR ELECTRONIC COMPUTER
David A. Lehman, Dayton, and Michael A. Walters, Kettering, both of Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 24, 1986, Ser. No. 857,591
Term of patent 14 years
U.S. Cl. D14—111



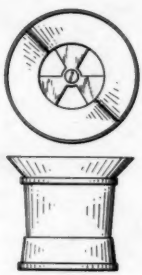
299,347
DISPLAY TERMINAL
Christian C. Landry, and Robert T. Faranda, both of Acton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 29, 1985, Ser. No. 792,703
Term of patent 14 years
U.S. Cl. D14—113



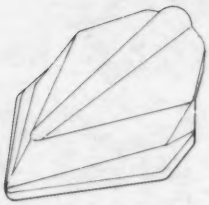
299,348
TURNABLE AND REPLACEABLE MEMBER FOR PLOWSHARE
Olav Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Jan. 3, 1986, Ser. No. 816,115
Claims priority, application Norway, Jul. 8, 1985, 66445
Term of patent 14 years
U.S. Cl. D15—11



299,349
HOUSING FOR LEAF SHREDDER
Joseph M. Cunning, Cohasset, Mass., assignor to Armatron International, Inc., Mass.
Filed Dec. 29, 1986, Ser. No. 947,483
Term of patent 14 years
U.S. Cl. D15—28



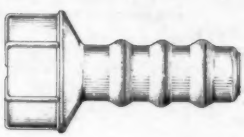
299,350
OVERCAP POINT FOR TILLAGE TOOL
Delmar D. Edmisson, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymond, Okla.
Filed May 15, 1986, Ser. No. 863,540
Term of patent 14 years
U.S. Cl. D15—29



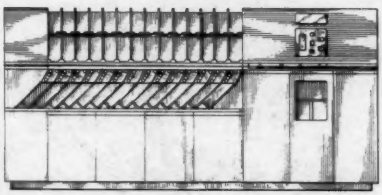
299,351
SHANK TIP INSERT FOR TILLAGE TOOL
Delmar D. Edmisson, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymon, Okla.
Filed May 23, 1986, Ser. No. 867,289
Term of patent 14 years
U.S. Cl. D15—29

299,352
TORCH TIP
Richard A. Spaulding, Hanover, and Pearl A. Grant, Grantham, both of N.H., assignors to Thermal Dynamics Corporation, West Lebanon, N.H.
Filed Jun. 11, 1985, Ser. No. 742,291
Term of patent 14 years
U.S. Cl. D15—144

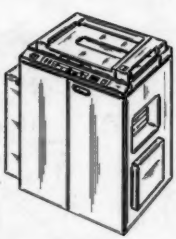
299,353
HANDLE FOR ROLL OF PLASTIC FILM
Joseph Goldstein, 1700 Palisades Dr., Pacific Palisades, Calif. 90272
Continuation-in-part of Ser. No. 913,218, Sep. 29, 1986. This application Oct. 23, 1986, Ser. No. 922,547
Term of patent 14 years
U.S. Cl. D15—145



299,354
BILL SORTING MACHINE
Ugo Panini, corso Cosenza 18, Torino, Italy 10135
Filed Mar. 18, 1986, Ser. No. 844,999
Term of patent 14 years
U.S. Cl. D15—199

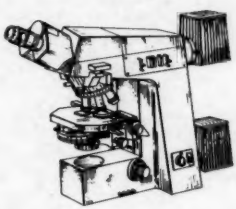


299,355
COPYING MACHINE
Mikio Kosako, and Hiroshi Nishibori, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 7, 1986, Ser. No. 894,355
Claims priority, application Japan, Feb. 7, 1986, 61-4238
Term of patent 14 years
U.S. Cl. D18—39



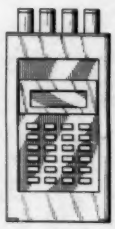
299,356
EYEGLASS RETAINER
Todd G. Lyons, Dayton, Ohio, assignor to Powder Bleu U.S.A. Inc., West Carrollton, Ohio
Filed Aug. 28, 1986, Ser. No. 901,509
Term of patent 14 years
U.S. Cl. D16—123

299,357
MICROSCOPE
Rolf Garnich, Esslingen, and Hermann Leura, Vluyn, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany
Filed Jul. 26, 1985, Ser. No. 759,146
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, MR 770
Term of patent 14 years
U.S. Cl. D16—131

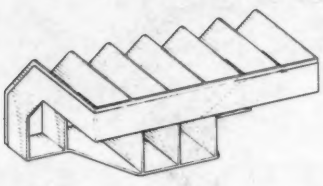


299,358
TYPEWRITER
Akira Tsukada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 22, 1986, Ser. No. 899,498
Claims priority, application Japan, Feb. 25, 1986, 61-6906
Term of patent 14 years
U.S. Cl. D18—1

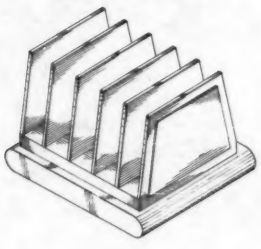
299,359
PORTABLE DESK TOOL KIT
Ann S. Cain, Cincinnati, Ohio, assignor to 'Totes', Incorporated, Loveland, Ohio
Filed Oct. 30, 1985, Ser. No. 792,738
Term of patent 14 years
U.S. Cl. D19—75



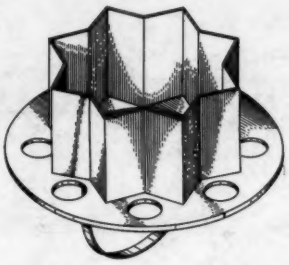
299,360
VERTICAL FILE OR THE LIKE
Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Oct. 1, 1985, Ser. No. 782,379
Term of patent 14 years
U.S. Cl. D19—90



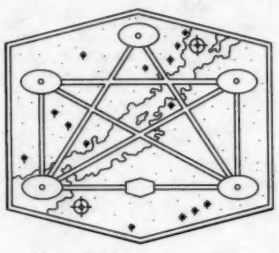
299,361
LETTER SORTER
Arlan D. Lothe, Sun Prairie, Wis., assignor to Don Evans, Inc., DeForest, Wis.
Filed Dec. 23, 1985, Ser. No. 812,061
Term of patent 14 years
U.S. Cl. D19—90



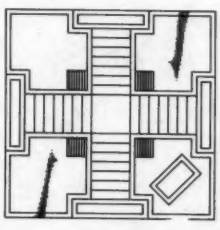
299,362
HEAD ATTACHED BALL CATCHER
Vincent Malfitano, 600 Duncan Ave. S., Clearwater, Fla. 33516
Filed Jun. 12, 1985, Ser. No. 744,037
Term of patent 14 years
U.S. Cl. D21—5



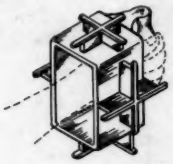
299,363
GAME BOARD
Steve Brooks, P.O. Box 307, 105 7th St., Grandfalls, Tex. 79742
Filed Apr. 28, 1986, Ser. No. 857,829
Term of patent 14 years
U.S. Cl. D21—31



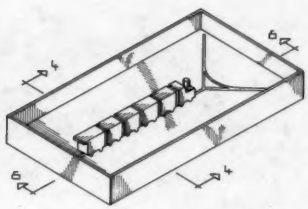
299,364
GAMEBOARD
William O. Jones, 3505 Brentwood, Odessa, Tex. 79762
Filed Apr. 18, 1986, Ser. No. 855,783
Term of patent 14 years
U.S. Cl. D21—34



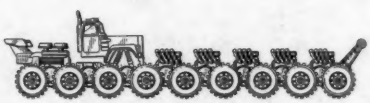
299,365
HAND HOLDABLE AQUATIC EXERCISER
Patrick M. Greeley, 900 Avon St., Charlottesville, Va. 22901
Filed Mar. 3, 1986, Ser. No. 841,370
Term of patent 14 years
U.S. Cl. D21—191



299,366
PUZZLE
Merrill G. Arnold, 3201 Wenatchee Ave., Bakersfield, Calif. 93306
Filed Apr. 18, 1986, Ser. No. 855,785
Term of patent 14 years
U.S. Cl. D21—104

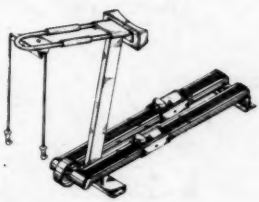


299,367
TOY VEHICLE
Ying K. Chan, Hong Kong, Hong Kong, assignor to Scientific Toys Limited, Chai Wan, Hong Kong
Filed Aug. 18, 1986, Ser. No. 897,669
Claims priority, application United Kingdom, Jun. 16, 1986, 1034804
Term of patent 14 years
U.S. Cl. D21—134

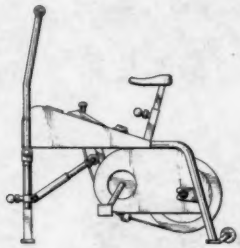


299,368
DOLL
Leslie D. Baker, 3522 N. Broadway St., #1 West, Chicago, Ill. 60657
Filed Nov. 27, 1985, Ser. No. 806,925
Term of patent 14 years
U.S. Cl. D21—171

299,369
SKIING EXERCISER OR SIMILAR ARTICLE
David B. Smith, Bellevue; Larry J. Graf, Snohomish, and Randolph F. Miller, Mt. Vernon, all of Wash., assignors to Precor Incorporated, Bothell, Wash.
Filed Oct. 9, 1986, Ser. No. 915,645
Term of patent 14 years
U.S. Cl. D21—191



299,370
EXERCISE CYCLE
Ronald A. McNeil, P.O. Box 14165, Tallahassee, Fla. 32317
Filed Nov. 5, 1985, Ser. No. 804,130
Term of patent 14 years
U.S. Cl. D21—194

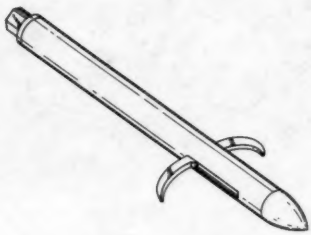


299,371
BICYCLE EXERCISE
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Osaka, Japan
Filed Feb. 18, 1986, Ser. No. 833,762
Term of patent 14 years
U.S. Cl. D21—194

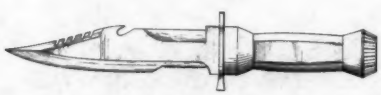
299,372
WEIGHT MASK
Jody Rhoden, and Troy Rhoden, both of P.O. Box 1165, Kerrville, Tex. 78029
Filed Aug. 8, 1986, Ser. No. 894,845
Term of patent 14 years
U.S. Cl. D21—196

299,373
EXERCISE WEIGHT
Matthew L. Parker, 1121 N. Olive Dr., West Hollywood, Calif. 90069, and Michael A. Hauser, 1347 N. Alta Vista Blvd., Los Angeles, Calif. 90046
Filed Jul. 14, 1986, Ser. No. 885,437
Term of patent 14 years
U.S. Cl. D21—196

299,374
STAKE
Charlesworth C. Williams, M Division USS Savnnah ADR-4 FPO, New York, N.Y. 23513
Filed Jul. 8, 1986, Ser. No. 883,090
Term of patent 14 years
U.S. Cl. D21—255

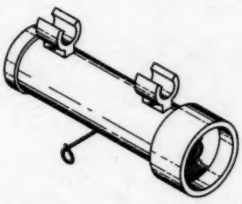


299,375
COMBINATION KNIFE
Kevin G. Pipes, P.O. Box 576, Sevierville, Tenn. 37862
Filed Apr. 16, 1986, Ser. No. 852,936
Term of patent 14 years
U.S. Cl. D22—118

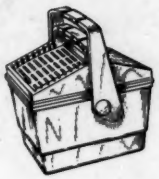


299,376
FISHING LURE
Vernon R. Burrows, 548 Highway 50, Grand Junction, Colo. 81503
Filed Apr. 22, 1986, Ser. No. 857,443
Term of patent 14 years
U.S. Cl. D22—129

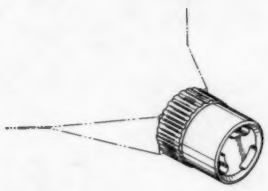
299,377
FISHING ROD LIGHT
Jose A. M. Garcia, 414 E. Hickory St., Midland, Tex. 79701
Filed Jun. 25, 1986, Ser. No. 878,477
Term of patent 14 years
U.S. Cl. D22—134



299,378
MINNOW BUCKET
Jeffery G. Martin, Kettering, Ohio, assignor to Frabill, Inc., Jackson, Wis.
Filed Apr. 29, 1986, Ser. No. 858,278
Term of patent 14 years
U.S. Cl. D22—136



299,379
AIR VALVE CLOSURE FOR INFLATABLE ARTICLE
Peter D. Haggerty, 3233 23rd Ave., W., Seattle, Wash. 98199, and Eric L. Rayl, 7625 S. Laurel St., Seattle, Wash. 98178
Filed May 2, 1985, Ser. No. 729,677
Term of patent 14 years
U.S. Cl. D23—249



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JANUARY, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Albrecht, William L.; and Wu, Edwin S., to Pennwalt Corporation. Flavonoxypropanolamines and esters of flavonoxypropanolamines as antiarrhythmic agents. 4,797,498, Cl. 549-403.000.

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Moore, Paul E.; Henderson, Jeffrey S.; Soisson, Lawrence R.; and Toth, Andrew J., 4,797,528, Cl. 219-70.000.

ARCO Chemical Company: *See*—
Cuscurida, Michael, 4,797,459, Cl. 526-209.000.
Dehm, David C.; and Lawson, H. Franklin, 4,797,450, Cl. 525-326.700.

Ardenti, Angelo M. Means and method of protecting data stored on optical or magnetic media or various sizes and shapes. 4,796,755, Cl. 206-444.000.

Ardley, John H.; Smith, Brett A.; and Nicholls, Alison W., to Wellcome Australia Limited. Method of and apparatus for applying a fluid to a bulk commodity. 4,797,301, Cl. 427-8.000.

Arfors, Karl E., to Pharmacia AB. Method for reperfusion therapy. 4,797,277, Cl. 424-85.800.

Arielly, Salo: *See*—
Gustavsson, Stig I.; and Arielly, Salo, 4,797,472, Cl. 530-331.000.

Ariga, Toshiaki; Koshiyama, Ikunori; and Fukushima, Danji, to Kikkoman Corporation. Antioxidant comprising proanthocyanidin as principal component. 4,797,421, Cl. 514-844.000.

Arii, Katsuyuki, to Fujitsu Limited. Apparatus for loading and unloading a vacuum processing chamber. 4,797,054, Cl. 414-217.000.

Arimoto, Kazutami: *See*—
Matsumoto, Noriaki; Mashiko, Koichiro; Arimoto, Kazutami; Furutani, Kiyohiro; and Matsuda, Yoshio, 4,797,001, Cl. 365-189.000.

Arizona Chemical Company: *See*—
Davis, Curry B., 4,797,460, Cl. 526-281.000.

Armco Inc.: *See*—
Kilbane, Farrell M.; and Dunbar, F. Curtiss, 4,797,329, Cl. 428-623.000.

Armodel S.A.: *See*—
Fouassier, Jean P., 4,796,849, Cl. 248-619.000.

Arms, Thomas H.: *See*—
Kovaleski, Joseph G.; and Arms, Thomas H., 4,796,966, Cl. 350-96.200.

Armstrong, Jeffrey A.: *See*—
Armstrong, Maclay M.; Houser, Steven A.; and Armstrong, Jeffrey A., 4,797,095, Cl. 433-22.000.

Armstrong, Maclay M.; Houser, Steven A.; and Armstrong, Jeffrey A., to Unitek Corporation. Orthodontic hook mounting. 4,797,095, Cl. 433-22.000.

Armstrong, Thomas, to Paradyne Corporation. Multiple virtual multipoint modem using TDM/token throwing technique. 4,797,878, Cl. 370-96.000.

Armstrong World Industries, Inc.: *See*—
Balmer, Richard H.; and Pfeiffer-Meshaw, Barbara A., 4,797,315, Cl. 428-167.000.
Davey, Raymond G.; and Dees, Martin, Jr., 4,797,314, Cl. 428-167.000.

Arnouts, Dirk: *See*—
Beer, Henri B.; and Arnouts, Dirk, 4,797,182, Cl. 204-14.100.

Arques, Marc: *See*—
Berger, Jean L.; and Arques, Marc, 4,797,546, Cl. 250-214.00R.
Berger, Jean L.; and Arques, Marc, 4,797,560, Cl. 250-578.000.

Artel: *See*—
Curtis, Richard H., 4,797,000, Cl. 356-436.000.

Arthur A. Collins, Inc.: *See*—
Collins, Arthur A., 4,797,589, Cl. 370-63.000.

Asazawa, Hiroshi, to NEC Corporation. Flip-flop circuit with short propagation delay. 4,797,576, Cl. 307-272.100.

Asbeck, Adolf: *See*—
Hoefer, Rainer; Schmid, Karl H.; Asbeck, Adolf; and Held, Uwe, 4,797,222, Cl. 252-174.210.

Ascolectric Limited: *See*—
Dry, Alan G., 4,796,515, Cl. 92-137.000.

Asea Aktiebolag: *See*—
Nimmersjo, Gunnar, 4,797,805, Cl. 364-481.000.

Ashcraft, William D., to Rockwell International Coporation. Digital image interface system. 4,797,746, Cl. 358-140.000.

Ashe, Bonnie Mae: *See*—
Finke, Paul E.; Zimmerman, Morris; Doherty, James B.; Ashe, Bonnie Mae; and Dorn, Conrad P., 4,797,396, Cl. 514-210.000.

Asmund S. Laerdal: *See*—
Laerdal, Tore; Aamodth, Kjell; and Eikeland, Harald, 4,797,104, Cl. 434-265.000.

Asoshina, Eishi: *See*—
Sakuramoto, Takahumi; Asoshina, Eishi; Tominaga, Takashi; Ijichi, Ichiro; Kamei, Kiyohiro; and Konishi, Toshiharu, 4,797,251, Cl. 419-9.000.

AT&T Information Systems Inc.: *See*—
Bowker, Duane O.; Giuliani, Adrian A.; and Jones, David F., 4,797,915, Cl. 379-216.000.
Pope, Kevin T.; and Trimble, David C., 4,797,877, Cl. 370-62.000.

AT&T and Philips Telecommunications B.V.: *See*—
Dekker, Hendrikus J.; and Velthof, Johannes H. M., 4,797,904, Cl. 375-60.000.

ATEQ Corporation: *See*—
Allen, Paul C.; and Warkentin, Paul A., 4,797,696, Cl. 354-4.000.

Atkins, Raymond C.: *See*—
Smithies, Stafford A.; and Atkins, Raymond C., 4,796,531, Cl. 102-217.000.

Atkinson, Arthur H.; and Buttolph, David E., to Small Brothers U.S.A., Inc. Maple syrup vaporizer apparatus with hollow shell recirculation arch. 4,796,602, Cl. 126-59.500.

Atlas Marine Technologies: *See*—
Tworoger, Peter C.; and Johnson, E. A., 4,797,055, Cl. 414-283.000.

ATOM Kabushiki Kaisha: *See*—
Sasaki, Migaku; Koike, Eiji; Ohtomo, Toshio; and Hirose, Jun, 4,796,605, Cl. 600-22.000.

Atwater, W. David, to Royal Textile Mills, Inc. Knee protector pad. 4,796,303, Cl. 2-24.000.

Au, Andrew T., to Dow Chemical Company, The. Antibacterial cyanomethyl carboxylates. 4,797,418, Cl. 514-521.000.

Aubanel, Marie-Line; and Bailly, Jean C., to BP Chemicals Limited. Amorphous high molecular weight copolymers of ethylene and alpha-olefins. 4,797,461, Cl. 526-348.600.

Aubert, Bruno, to Societe Generale pour les Techniques Nouvelles. Process for the preparation of a borosilicate glass containing nuclear waste. 4,797,232, Cl. 252-629.000.

Aubrey, David R.; and Jameson, Ian, to Electricity Council, The. Symmetrical fault current detector. 4,797,775, Cl. 361-93.000.

Auel, RaeAnn M.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,797,180, Cl. 204-1.00T.

Aussenberg, Nash: *See*—
Meier, Hans; and Aussenberg, Nash, 4,796,846, Cl. 248-286.000.

Austin, Richard L.; Otto, Herbert J.; and Jones, Frank L., to EG&G Gamma Scientific Incorporated. Method and apparatus for measuring spatial profiles of energy beams. 4,797,619, Cl. 324-409.000.

Austoft Inc. (U.S.A.): *See*—
Kanengieter, Glenn G.; and Stomberg, David E., 4,796,728, Cl. 188-18.00A.

Automated Medical Products, Corporation: *See*—
Meier, Hans; and Aussenberg, Nash, 4,796,846, Cl. 248-286.000.

Automation, Inc.: *See*—
Wales, R. Langdon; and Crowley, H. W., 4,796,782, Cl. 222-57.000.

Avarado Cendan, Jose M.; and Campa Campa, Flor, to Alumina Espanola S.A. Method for the obtention of an especial alumina from the

powder produced in metallurgical alumina calcination. 4,797,270, Cl. 423-625.000.
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., to Pitnery Bowes Inc. Letter preparing apparatus. 4,797,832, Cl. 364-478.000.
Ayers, Ray R., to Shell Oil Company. Marine electrical plug. 4,797,117, Cl. 439-200.000.
Ayres, Robert N. Slip stream device. 4,796,697, Cl. 166-90.000.
Azerbaidzhansky Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Neftyanogo Mashinostroenia: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
B-Conn, Inc.: *See*—
Brown, Robert L.; and Richesson, Roger W., 4,796,469, Cl. 73-49.200.
B. F. Goodrich Company, The: *See*—
Kletecka, George; Lai, John T.; and Son, Pyong-Nae, 4,797,438, Cl. 524-100.000.
Neuman, Richard C., 4,797,442, Cl. 524-394.000.
Roemke, Lowell W.; and Stevenson, Hildreth W., 4,797,306, Cl. 427-261.000.
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Sharaby, Zaev; and Vyvoda, Josef C., 4,797,443, Cl. 524-347.000.
Sharaby, Zaev, 4,797,458, Cl. 526-194.000.
B/K Patent Development, Inc.: *See*—
Burch, Lyndon W.; and Burch, Hadley K., 4,796,355, Cl. 29-622.000.
Babilius, Algis P. J.: *See*—
Clayton, Wilson A.; and Babilius, Algis P. J., 4,797,774, Cl. 361-86.000.
Bacon, Allan T.: *See*—
Blanchard, William C.; and Bacon, Allan T., 4,797,554, Cl. 250-287.000.
Bager, Lars. Method and apparatus for measuring variations in distances. 4,796,994, Cl. 356-358.000.
Baggarly, Brad A.; and Scullion, Christopher K., to Bell & Howell Company. Insertion machine with postage categorization and selective merchandising. 4,797,830, Cl. 364-464.030.
Bailey, Douglas S.: *See*—
Anderson, Arthur L.; Bailey, Douglas S.; and Korinek, Richard J., 4,797,621, Cl. 324-533.000.
Bailly, Jean C.: *See*—
Aubanel, Marie-Line; and Bailly, Jean C., 4,797,461, Cl. 526-348.600.
Bair, Kenneth W., to Burroughs Wellcome Co. Benzo[c]carbazole propanediol compound and salts thereof. 4,797,495, Cl. 548-420.000.
Baird Corporation: *See*—
Westell, William E., 4,797,745, Cl. 358-169.000.
Baker, Don R.; and Brownell, Keith H., to ICI Americas Inc. Fungicidal pyridyl carbamates. 4,797,407, Cl. 514-346.000.
Baker, Don R.; Brownell, Keith H.; and Kezerian, Charles, to Stauffer Chemical Co. Fungicidal carbanilates. 4,797,416, Cl. 514-485.000.
Baker Hughes Incorporated: *See*—
Carlin, Frank J.; and Wafford, Terrell F., 4,796,928, Cl. 285-334.000.
Halbardier, Floyd A., deceased, 4,796,707, Cl. 166-387.000.
Lembcke, Jeffrey J., 4,796,708, Cl. 166-386.000.
Baker, Joseph R. Zone selector and locking mechanism for sequencing valve. 4,796,657, Cl. 137-119.000.
Baker, Louis; and Holland, Gerald W., to Baker Rubber, Inc. Fabric reinforced rubber product having molded isolator bushings. 4,796,841, Cl. 248-60.000.
Baker Oil Tools, Inc.: *See*—
Carmody, Michael A.; and Lembcke, Jefferey J., 4,796,705, Cl. 166-323.000.
Baker Rubber, Inc.: *See*—
Baker, Louis; and Holland, Gerald W., 4,796,841, Cl. 248-60.000.
Baldwin, David R.; and Sata, Shingo, to Kabushiki Kaisha Toshiba. System and method for transferring data between a plurality of disks and a memory. 4,797,755, Cl. 360-49.000.
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., to Merck & Co., Inc. Thieno thiopyran sulfonamide derivatives, pharmaceutical compositions and use. 4,797,413, Cl. 514-432.000.
Balk, Hermann, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for making a thermoplastic monofilament of exact thickness. 4,797,079, Cl. 425-140.000.
Ball Corporation: *See*—
Nguyen, Tuan A., 4,796,772, Cl. 220-66.000.
Balle , Gerhard: *See*—
Sanders, Josef; Reiff, Helmut; Balle , Gerhard; and Dieterich, Dieter, 4,797,427, Cl. 521-159.000.
Balmer, Richard H.; and Pfeiffer-Meshaw, Barbara A., to Armstrong World Industries, Inc. Decorative surface coverings with dot patterns. 4,797,315, Cl. 428-167.000.
Balter, Valentin, to Huntington Mechanical Laboratories, Inc. Manipulator for vacuum applications. 4,797,053, Cl. 414-749.000.
Bannister, A. Karen; Brandriff, Kristen; Carlotto, John A.; DiDonato, Richard J.; Haigh, Virginia; and Sirois, Edmond, to Trifari, Krussman & Fishel, Inc. Comfort earring clip. 4,796,443, Cl. 63-14.500.
Baranescu, George S. Injection system with pilot injection. 4,796,577, Cl. 123-300.000.
Barby, Donald; and Haq, Zia, to Lever Brothers Company. Substrate carrying a porous polymeric material. 4,797,310, Cl. 428-71.000.
Barcan, Donald: *See*—
Kammerer, Gene W.; and Barcan, Donald, 4,797,309, Cl. 428-35.300.
Barenholz, Yechezkel; and Gabizon, Alberto, to Yissum Research and Development Company of the Hebrew University of Jerusalem; and Hadassah Medical Organization. Lipsome/anthraquinone drug composition and method. 4,797,285, Cl. 424-450.000.
Barker, Ronald. Bracket for use in securing an electric meter base. 4,796,844, Cl. 248-222.200.
Barkley, James D., to Foster Wheeler Energy Corporation. Closure assembly for a furnace. 4,796,543, Cl. 110-173.00R.
Barle, Louis; and Vliet, Ron. Protective surgical face mask. 4,796,621, Cl. 128-206.230.
Barmag AG: *See*—
Gerhards, Klaus, 4,796,340, Cl. 28-248.000.
Barnes, Stephen R.: *See*—
Huntsman, Lee L.; Leard, Richard S.; Tarbox, Gary L.; Barnes, Stephen R.; and McLaren, Barry D., 4,796,634, Cl. 128-662.010.
Barrandon, Georges: *See*—
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Barrow, Peter; and Wright, Michael L., to Lilliwyte Societe Anonyme. Method of preparing ceramic surfaces for wetting thereof by alkali metals. 4,797,332, Cl. 429-104.000.
Barry Wright Corporation: *See*—
Schubert, Dale W., 4,796,873, Cl. 267-136.000.
Bartek, Joseph P.; and Guttmann, Andrew T., to Standard Oil Company, The. Preparation of abrasion resistant alumina-supported vanadium-antimony oxidic catalysts. 4,797,381, Cl. 502-202.000.
Barth, Wayne E., to Pfizer Inc. 6-(1-carbamoyl-1-hydroxymethyl)-penicillanic acid derivatives. 4,797,394, Cl. 514-192.000.
Barthomeuf, Jean-Paul: *See*—
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Bartlett, Allen J., to Helix Technology Corporation. Remote recondenser with intermediate temperature heat sink. 4,796,433, Cl. 62-54.000.
Barykin, Boris J.: *See*—
Golovko, Viktor A.; Valts, Semen P.; Lekhno, Alexandr M.; Tetior, Alexandr N.; and Barykin, Boris J., 4,796,398, Cl. 52-169.200.
BASF Aktiengesellschaft: *See*—
Hagen, Helmut; Eichenauer, Ulrich; Plath, Peter; Meyer, Norbert; and Wuerzer, Bruno, 4,797,148, Cl. 71-94.000.
Pich, Claus H.; and Moest, Thomas, 4,797,287, Cl. 424-464.000.
Portugall, Michael; Blinne, Gerd; and Sterzel, Hans-Josef, 4,797,465, Cl. 528-176.000.
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; and Schlemmer, Lothar, 4,797,453, Cl. 525-397.000.
BASF Corporation: *See*—
Cowles, Richard A.; Georgalas, Nick; and Shah, Shailesh C., 4,797,444, Cl. 524-501.000.
Frentrup, Mark A.; Gibson, Joseph R.; Carson, James E.; and Davis, Pauls, 4,797,229, Cl. 252-345.000.
Ryang, Hong-Son, 4,797,454, Cl. 525-476.000.
Bastin, Danielle: *See*—
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Bates, James C.: *See*—
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Battista, Joseph P.: *See*—
Duncan, Howard C., IV; Gray, R. William; and Battista, Joseph P., 4,797,855, Cl. 364-900.000.
Bauder, Albrecht: *See*—
Schiel, Christian; and Bauder, Albrecht, 4,796,525, Cl. 100-93.0RP.
Bauer, Hans J.: *See*—
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Bauer, Hans-Peter; Bauer, Hans J.; Stadelmann, Ludwig; and Frisch, Emil, to Fritz Bauer & Sohne oHG. Gas spring with end position damping. 4,796,871, Cl. 267-64.110.
Bauer, John K. Four-wheel steering, leveling and banking for vehicles. 4,796,720, Cl. 180-234.000.
Bauer, Ralph, to Norton Company. Boehmite produced by a seeded hydyothermal process and ceramic bodies produced therefrom. 4,797,139, Cl. 51-293.000.
Bauer, Ralph; and Franklin, Rufus M., to Norton Company. Production of beta alumina by seeding and beta alumina produced thereby. 4,797,269, Cl. 423-600.000.
Baumann, Hans-Peter, to Sandoz Ltd. Use of certain quaternary ammonium compounds in dyeing leather with basic dyestuffs. 4,797,131, Cl. 8-436.000.
Baus, Rene, Jr., to American Magnetics Corporation. Digital magnetic head structure. 4,797,767, Cl. 360-121.000.
Bausano & Figli S.p.A.: *See*—
De Bernardi, Stefano, 4,796,487, Cl. 74-665.0GA.
Baxter, Carlton J.; and Baxter, David C. Method and apparatus for monitoring fluid flow. 4,797,666, Cl. 340-606.000.
Baxter, David C.: *See*—
Baxter, Carlton J.; and Baxter, David C., 4,797,666, Cl. 340-606.000.
Baxter Travenol Laboratories, Inc.: *See*—
Bullock, James K.; Mann, L. Arnold; and Kuni, Daniel R., 4,796,615, Cl. 128-202.270.

Bayer Akteingesellschaft: *See*—
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Bayer Aktiengesellschaft: *See*—
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Hasa, Peter; and Kogelnik, Hans-Joachim, 4,797,430, Cl. 521-164.000.
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,797,412, Cl. 514-383.000.
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; Schafer, Hermann; and Rasshofer, Werner, 4,797,320, Cl. 428-316.600.
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,797,484, Cl. 544-215.000.
Sanders, Josef; Reiff, Helmut; Balle , Gerhard; and Dieterich, Dieter, 4,797,427, Cl. 521-159.000.
Sasse, Klaus; Hagemann, Hermann; Santel, Hans-Joachim; and Schmidt, Robert R., 4,797,146, Cl. 71-92.000.
Scholl, Thomas; Serini, Volker; Rathmann, Dietrich; Savage, Ross; and Kircher, Klaus, 4,797,435, Cl. 524-89.000.
Bayerische Motoren Werke AG: *See*—
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Baynes, Dennis, to General Motors Corporation. Closure latch. 4,796,930, Cl. 292-58.000.
BBC Brown Boveri AG: *See*—
Kluge, Dietrich, 4,797,781, Cl. 361-332.000.
BBC Brown, Boveri & Company Limited: *See*—
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BBC Brown, Boveri Ltd.: *See*—
El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.
Beard, Lloyd R., to A. B. Chance Company. Electronic sectionalizer and mounting structure for switchgear. 4,797,777, Cl. 361-115.000.
Beardslee, John: *See*—
Vorzimmer, Mark A.; and Beardslee, John, 4,797,657, Cl. 340-541.000.
Beasley, Craig J., to Western Atlas International, Inc. Method of processing seismic data. 4,797,861, Cl. 367-50.000.
Beaulieu, Laurence A. J.; and Cristescu, Alex G., to Northern Telecom Limited. Connector bodies and assemblies. 4,797,124, Cl. 439-719.000.
Bechem, Klaus: *See*—
Bechem, Ulrich W.; Bechem, Klaus; and Bechem, Philip C., 4,796,713, Cl. 175-96.000.
Bechem, Philip C.: *See*—
Bechem, Ulrich W.; Bechem, Klaus; and Bechem, Philip C., 4,796,713, Cl. 175-96.000.
Bechem, Ulrich W.; Bechem, Klaus; and Bechem, Philip C. Activated earth drill. 4,796,713, Cl. 175-96.000.
Beck, Eliezer: *See*—
Yecheskel, Herzel B.; Alon, Gad; and Beck, Eliezer, 4,796,334, Cl. 19-0.270.
Becker, Neal D.: *See*—
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King, Francis D., 4,797,387, Cl. 514-212.000.
Beer, Henri B.; and Arnouts, Dirk, to ELTECH Systems Corporation. Electrode with a platinum metal catalyst in surface film and its use. 4,797,182, Cl. 204-14.100.
Beese, Howard. Fishhook holder. 4,796,380, Cl. 43-57.100.
Begley, Douglas G., to Continental White Cap, Inc. Molded plastic closure with split skirt tamperband. 4,796,770, Cl. 215-252.000.
Bego Bremer Goldschagerei Wilh. Herbst GmbH & Co.: *See*—
Gundlach, Hans-Werner; and Jacob, Friedrich, 4,796,688, Cl. 164-457.000.
Bekker, Vladimir O.: *See*—
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Belanger, Thomas D., Jr., to GTE Communication Systems Corporation. Substrate mounting device. 4,797,784, Cl. 361-395.000.
Belanger, Thomas D., Jr., to GTE Communication Systems Corporation. Substrate mounting device. 4,797,786, Cl. 361-419.000.
Belkin, Naum S., administrator: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Belkina, Tamara M., deceased: *See*—
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Bell Communications Research, Inc.: *See*—
Bussey, Howard E., Jr.; Giacopelli, James N.; and Marcus, William S., 4,797,880, Cl. 370-60.000.
Lin, Daniel, 4,797,925, Cl. 381-36.000.
Bell & Howell Company: *See*—
Baggarly, Brad A.; and Scullion, Christopher K., 4,797,830, Cl. 364-464.030.
Bellay, Jeffrey D.; McDonough, Kevin C.; and Patrick, Michael W., to Texas Instruments Incorporated. Microcomputer with self-test of macrocode. 4,797,808, Cl. 364-200.000.
Beloit Corporation: *See*—
Thoma, Ed, 4,796,818, Cl. 241-85.000.
Ben-Artzi, Amatzia, to Sytek, Inc. Bridge system for connecting networks. 4,797,881, Cl. 370-88.000.
Benanti, Giuseppe, to S.I.F.I. Societa Industria Farmaceutica Italiana S.p.A. Lysine salt of 4-diphenylacetic acid and its ophthalmic fomulations. 4,797,423, Cl. 514-914.000.
Bendig, Donna A.: *See*—
Bendig, Thomas J.; and Bendig, Donna A., 4,796,416, Cl. 56-16.900.
Bendig, Lothar; and Hofmann, Frieder, to Lechler GmbH & C. KG. Ultrasonic atomizer for liquids. 4,796,807, Cl. 239-102.200.
Bendig, Thomas J.; and Bendig, Donna A. Portable shredder/lawn mower for garden use and the like. 4,796,416, Cl. 56-16.900.
Bendix Electronics S.A.: *See*—
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Benedetti, Giampietro; and Fassano, Fulvio, to Danieli & C. Officine Meccaniche SpA. Plant to convert a metallic charge into semifinished products, and connected smelting and casting method. 4,797,154, Cl. 75-46.000.
Beneteau, Christian; and Guerard, Norbert, to Champion Spark Plug Europe S.A. Device for connecting a wiping element to the superstructure of a wiper blade. 4,796,326, Cl. 15-250.420.
Benkara, Ferial; and Campbell, Daniel, to Enertec. Digital resonant filter. 4,797,846, Cl. 364-724.170.
Benke Instrument & Elektro Ag: *See*—
Seidel, Rudolf, 4,797,254, Cl. 422-49.000.
Benuzzi, Gino, deceased; and by Benuzzi, Lidia, Heiress-at-law. Shifting device. 4,796,500, Cl. 83-277.000.
Benuzzi, Lidia, Heiress-at-law: *See*—
Benuzzi, Gino, deceased; and Benuzzi, Lidia, Heiress-at-law, 4,796,500, Cl. 83-277.000.
Benz, Dieter. Electric toothbrush. 4,796,323, Cl. 15-23.000.
Berezin, Vitaly B.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., to Shop-Vac Corporation. Portable electric blower. 4,797,072, Cl. 417-423.200.
Berg, Kenneth A., to PQ Corporation. Chillproofing with magnesium silicate/silica gel agents. 4,797,294, Cl. 426-330.400.
Berger, Jean L.; and Arques, Marc, to Thomson-CSF. Method for reading a light-sensitive element constituted by a photodiode and a capacitor. 4,797,546, Cl. 250-214.00R.
Berger, Jean L.; and Arques, Marc, to Thomson-CSF. Matrix of photosensitive elements and an associated reading method in image formation. 4,797,560, Cl. 250-578.000.
Berger, Jean P.; Bridgen, Evans H.; and Owens, Alfred W., to Northern Telecom Limited. Automatic solder paste application to circuit boards. 4,796,560, Cl. 118-211.000.
Bergersen, Earl O. Muscular expansion bumper and head-gear appliance. 4,797,093, Cl. 433-5.000.
Berglund, Asta B.; Akerblom, Eva B.; and Hedin, Anders J., to Pharmacia AB. Antibody preparation with specificity for 4-(2-Aminoethyl) Imidazoyl group manufacture and use of the antibody preparation. 4,797,370, Cl. 436-518.000.
Bergmann, Konrad, to American Standard Inc. Sanitary single-handle mixing valve. 4,796,666, Cl. 137-625.170.
Bergstrom, Anders; and Sevrell, Gosta, to AB Tetra Pak. Device for braking articles to be conveyed on a conveyer and braking rubber tubes therefor. 4,796,746, Cl. 198-463.400.
Berkman, John W.: *See*—
Krasner, Gary N.; and Berkman, John W., 4,796,623, Cl. 128-305.000.
Berne, Jean G., to Societe Nouvelle Des Ateliers Et Chantiers Du Havre. Automatically controlled machine for rolling metal sheets. 4,796,449, Cl. 72-9.000.
Bernstein, Joel; and Spinner, Samuel, to Elisra Electronic Systems Ltd. Waveguide-fed microwave system particularly for cavity-backed spiral antennas for the Ka band. 4,797,684, Cl. 343-895.000.
Berrett, Thomas R., to Browaline (U.K.) Limited. Extenders for aircraft pallets. 4,796,539, Cl. 108-55.100.
Berthelius, Rolf; and Fredriksson, Tommy, to Kanthal AB. Foil element. 4,797,537, Cl. 219-528.000.
Bertiller, Roland, to Mauser-Werke Oberndorf GmbH. Adapter cartridge for insertion tube systems. 4,796,535, Cl. 102-446.000.
Bertolini, Guglielmo: *See*—
Roggero, Arnaldo; Bertolini, Guglielmo; and Busetto, Carlo, 4,797,451, Cl. 525-332.900.
Besser, Robert G. Mobile truck turntable. 4,796,537, Cl. 104-37.000.
Betz Laboratories, Inc.: *See*—
Merrell, Gene A.; and Sujdak, Richard J., 4,796,548, Cl. 110-343.000.
Roling, Paul V., 4,797,504, Cl. 560-4.000.
Bigej, Albert L. Fisherman's pliers. 4,796,318, Cl. 7-106.000.

Bilas, Michael. Automobile wheel lift. 4,797,058, Cl. 414-563.000.

Billings, Robert L.; Bowers, Mark A.; and Meier, Frankie G., to American Telephone and Telegraph Company—AT&T Information Systems. Power regulator for a contactless credit card system. 4,797,541, Cl. 235-449.000.

Billington, Richard W.; and Williams, Jill A., to Dentsply Limited. Glass/poly(carboxylic acid) cement compositions. 4,797,431, Cl. 523-116.000.

Binger, Bernhard; Eickhoff, Hans J.; Maier, Paul; Engstler, Anton; and Grolig, Herbert, to Zahnradfabrik Friedrichshafen AG. Gear mechanism for full-track vehicle. 4,796,486, Cl. 74-606.00R.

Bingham, David: *See*—
Fuller, Roger W.; and Bingham, David, 4,797,899, Cl. 375-7.000.

Bingham, Richard: *See*—
Allred, Jimmie B., III; and Bingham, Richard, 4,796,607, Cl. 128-4.000.

Bini, Dante; Bogliari, Domenico; Lomoro, Sandro; Minozzi, Daniele; Pietrogrande, Stefano; and Zucchi, Dario, to Binistar International N.V. Reticular spatial structure. 4,796,389, Cl. 52-2.000.

Binistar International N.V.: *See*—
Bini, Dante; Bogliari, Domenico; Lomoro, Sandro; Minozzi, Daniele; Pietrogrande, Stefano; and Zucchi, Dario, 4,796,389, Cl. 52-2.000.

Biosystems Inc.: *See*—
Burt, John F.; Whynall, Jeffrey M.; Howe, Jonathan; Knott, Gilbert L.; and Harnvorakiat, Tavin, 4,796,467, Cl. 73-168.000.

Biotrack, Incorporated: *See*—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,797,283, Cl. 424-443.000.

Bird, John W., to Birow, Inc. Adjustable coating and printing apparatus. 4,796,556, Cl. 118-46.000.

Birow, Inc.: *See*—
Bird, John W., 4,796,556, Cl. 118-46.000.

Blaha, Charles: *See*—
Sevier, David C., 4,797,214, Cl. 210-651.000.

Blake-Coleman, Barry; and Clarke, David, to Public Health Laboratory Service Board. Apparatus for measuring fluid density. 4,796,468, Cl. 73-32.00A.

Blanc, Floreal; and Bonnejean, Claude, to Commissariat a l'Energie Atomique. Optical fibre monitoring device using a synchronization selector to channel optical signals. 4,797,547, Cl. 250-221.000.

Blanchard, William C.; and Bacon, Allan T., to Allied-Signal Inc. Ion mobility spectrometer. 4,797,554, Cl. 250-287.000.

Bland, William N., Jr.: *See*—
Thomas, Charles A.; and Bland, William N., Jr., 4,796,972, Cl. 350-99.000.

Blaser, Laura J.: *See*—
Crucil, Guy A.; and Blaser, Laura J., 4,797,224, Cl. 252-181.000.

Blatter, Andreas: *See*—
Von Allmen, Martin; and Blatter, Andreas, 4,797,166, Cl. 148-13.100.

Blaushild, Ronald M.; Golick, Leonard R.; Samluk, Stephen L.; and Tome, Richard E., to Westinghouse Electric Corp. Thermal insulation of nuclear reactor. 4,797,247, Cl. 376-289.000.

Blazevic, David T. Apparatus for improving hot strip mill processing. 4,796,450, Cl. 72-39.000.

Blewitt, William D.: *See*—
Young, John S.; Kruis, Peter; and Blewitt, William D., 4,797,654, Cl. 341-50.000.

Blinne, Gerd: *See*—
Portugall, Michael; Blinne, Gerd; and Sterzel, Hans-Josef, 4,797,465, Cl. 528-176.000.

Bloemer, Robert W.: *See*—
McEntee, Timothy J.; Bloemer, Robert W.; Oxley, Donald W.; and Thatte, Satish M., 4,797,810, Cl. 364-200.000.

Blonstein, Steven M.: *See*—
Ference, Jonathan H.; Blonstein, Steven M.; Rowen, Michael J.; and Newman, Robert C., Jr., 4,797,599, Cl. 315-194.000.

Board of Regents, The University of Texas System: *See*—
Finkelstein, David B., 4,797,359, Cl. 435-68.000.

Board of Trustees, University of Illinois: *See*—
Teodorescu, Marius C.; and Gaspar, Alexandre M., 4,797,363, Cl. 435-235.000.

Boardman Molded Products, Inc.: *See*—
Kessler, Ronald N.; Ullman, Myron; and Kessler, Milton, 4,796,399, Cl. 52-177.000.

Boehm, Wolfgang; Hausselt, Juergen; Weise, Wolfgang; and Malikowsik, Willi, to Degussa Aktiengesellschaft. Soft-solder alloy for bonding ceramic articles. 4,797,328, Cl. 428-621.000.

Boehringer Mannheim Corporation: *See*—
Watlington, Thomas M., IV, 4,797,256, Cl. 422-58.000.

Boeing Company, The: *See*—
Das, K. Bhagwan, 4,797,155, Cl. 75-229.000.
Falk, R. A.; and Capps, C. D., 4,797,843, Cl. 364-713.000.
Hatcher, G. Stephen, 4,797,635, Cl. 331-17.000.
Hebert, Michael R.; and Lauder, Arnold J., 4,797,172, Cl. 156-425.000.
Pinson, George T., 4,796,833, Cl. 244-3.120.

Boen, Jerry D.: *See*—
Fulton, David A.; and Boen, Jerry D., 4,796,403, Cl. 52-713.000.

Bogliari, Domenico: *See*—
Bini, Dante; Bogliari, Domenico; Lomoro, Sandro; Minozzi, Daniele; Pietrogrande, Stefano; and Zucchi, Dario, 4,796,389, Cl. 52-2.000.

Bohn, Gerhard; Steinmetz, Guenter; and Steenbeck, Ulf, to Messerschmitt-Boelkow Blohm Gesellschaft mit beschraenkter Haftung. Process and devices for producing pressure - or shear-waves in a solid medium. 4,796,724, Cl. 181-106.000.

Boler, Clifford H.; Hartranft, Marc D.; and Hendrickson, Thomas E., to Honeywell Inc. Reducing bipolar parasitic effects in IGFET devices. 4,797,724, Cl. 357-42.000.

Bommer, Rolf. Furnace boiler and process for the operation of the boiler. 4,796,569, Cl. 122-6.00A.

Bona, Alfredo D.; and Airaghi, Attilio, to Murray Europe S.p.A. Mobile joint for connectors. 4,796,927, Cl. 285-190.000.

Bond, Curtin J., to Liqui-Box Corporation. Bag-in-box packaging and dispensing of substances which will not readily flow by gravity. 4,796,788, Cl. 222-94.000.

Bonnejean, Claude: *See*—
Blanc, Floreal; and Bonnejean, Claude, 4,797,547, Cl. 250-221.000.

Borer Electronics AG: *See*—
Massey, James L.; and Rueppel, Rainer A., 4,797,922, Cl. 380-46.000.

Bortman, Issar. Angularly adjustable double headed toothbrush. 4,796,325, Cl. 15-167.200.

Bory, Steven, to Injecto Mold. Faucet handle. 4,796,329, Cl. 16-121.000.

Borzym, John J., to Alpha Industries, Inc. Method for dimple free guillotine cutting of multiple wall tube. 4,796,498, Cl. 83-49.000.

Bosek, Ronald P., to GTE Valenite Corporation. Cutting tool bit support. 4,797,039, Cl. 407-87.000.

Boselli, Alain, to Dunlop France. Mattress with aeration cavities. 4,796,316, Cl. 5-464.000.

Boston University: *See*—
Lempicki, Alexander, 4,797,889, Cl. 372-39.000.

Bostrom, Norman A. Microwave ion source. 4,797,597, Cl. 315-39.000.

Botka, Julius, to Hewlett-Packard Company. Adjustable length slotless female contact for connectors. 4,797,126, Cl. 439-843.000.

Bourgeois, Roy M., to American Allsafe Company. Method for retaining goggles on helmet. 4,796,308, Cl. 2-243.00R.

Bowers, Mark A.: *See*—
Billings, Robert L.; Bowers, Mark A.; and Meier, Frankie G., 4,797,541, Cl. 235-449.000.

Bowers, Mark L.: *See*—
Durfor, Charles N.; Bowers, Mark L.; and Yenser, Barbara A., 4,797,181, Cl. 204-1.00T.

Bowie, Betty A.; Hedde, Richard D.; Lindsey, Thomas O.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., to SmithKline Beckman Corporation. Antibiotics produced by *Kibdelosporangium aridum* Shearer gen. nov., sp. nov. ATCC 39323. 4,797,280, Cl. 424-118.000.

Bowker, Duane O.; Giuliani, Adrian A.; and Jones, David F., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communication system having automatic call route selection. 4,797,915, Cl. 379-216.000.

Bowman, Robert L.: *See*—
Lu, David Y.; and Bowman, Robert L., 4,796,622, Cl. 128-303.100.

Boy, Juergen, to Siemens Aktiengesellschaft. Gas discharge path. 4,797,778, Cl. 361-130.000.

Boyacigiller, Ziya G., to Maxim Integrated Products. Apparatus for pre-defining circuit characteristics. 4,797,569, Cl. 307-297.000.

Boyce, Ted L. Rocker/glider. 4,796,949, Cl. 297-259.000.

Boyd, Ronald J.; Law, Wing; and Wilson, Gary L., to General Electric Company. Standoff adapter for ultrasound probe. 4,796,632, Cl. 128-662.030.

Bozhko, Valery P.; Yatsenko, Sergei V.; Strizhenko, Vitaly E.; Losev, Alexei V.; Pleshkov, Viktor I.; and Junash, Viktor M., to Kharkovsky Aviatsionny Institut. Apparatus for thermal deburring of parts. 4,796,867, Cl. 266-51.000.

Bozhko, Valery P.; Losev, Alexei V.; Strizhenko, Vitaly; Pleshkov, Viktor I.; and Levityansky, Ivan A., to Kharkovsky Aviatsionny Institut. Apparatus for thermal deburring of parts. 4,796,868, Cl. 266-51.000.

Bozich, George J.: *See*—
Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., 4,796,460, Cl. 72-453.130.

BP Chemicals Ltd.: *See*—
A'Court, Richard, 4,797,487, Cl. 544-279.000.
Aubanel, Marie-Line; and Bailly, Jean C., 4,797,461, Cl. 526-348.600.

Brakenhoff, Godefridus J., to Stichting Voor De Technische Wetenschappen. Device for focusing electromagnetic waves or sound. 4,796,974, Cl. 350-247.000.

Brandes, Wilhelm: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lursaen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,797,412, Cl. 514-383.000.

Brandon, Malcolm R.: *See*—
Patroni, Joseph J.; and Brandon, Malcolm R., 4,797,474, Cl. 530-351.000.

Brandriff, Kristen: *See*—
Bannister, A. Karen; Brandriff, Kristen; Carlotto, John A.; DiDonato, Richard J.; Haigh, Virginia; and Sirois, Edmond, 4,796,443, Cl. 63-14.500.

Brandt, Alan E.; and Uemura, Morito, to Konishiroku Photo Industries, Co., Ltd. Monoclonal antibodies specific to glactosyltransferase isoenzyme II and their use in cancer immunoassays. 4,797,356, Cl. 435-7.000.

Brandt, Incorporated: *See*—
Nicholson, William; Groff, Gordon H.; and Jones, Paul C., 4,796,878, Cl. 271-10.000.

Branstetter, Ronald L.; and Edgar, Reuben W., Jr., to Nippon Colin Co., Ltd. Noninvasive reflectance oximeter. 4,796,636, Cl. 128-633.000.

Brash, Robert A. D.; Wicks, Anthony J.; and Wilson, Eric T., to Wicks & Wilson Limited. Integrated scanner/plotter for microfilm aperture cards. 4,797,709, Cl. 355-27.000.

Brauers, Bert; and Morsbach, Martin, to Goetze AG. Oil scraper piston ring with elliptical oil vent holes. 4,796,898, Cl. 277-216.000.

Braun Aktiengesellschaft: *See*—
Oprach, Klaus; Harms, Luhr; Braun, Gebhard; and Trolltsch, Karl, 4,796,359, Cl. 30-43.920.

Braun, Gebhard: *See*—
Oprach, Klaus; Harms, Luhr; Braun, Gebhard; and Trolltsch, Karl, 4,796,359, Cl. 30-43.920.

Braxmeier, Hans, to Novibra GmbH. Bearing support for a twisting or spinning machine. 4,796,419, Cl. 57-134.000.

Brechbuehler, Fritz, to Pebea, N.V. Reinforcing rod holder for use in joining cast concrete work. 4,796,851, Cl. 249-91.000.

Breitfelder, Peter: *See*—
Pospischil, Reginhard; Breitfelder, Peter; and Timmermann, Uwe, 4,797,875, Cl. 370-92.000.

Brems, John H. Rotary reversible indexing mechanism. 4,796,477, Cl. 74-52.000.

Brennan, Thomas M.; and Hendrick, Michael E., to Pfizer, Inc. Branched amides of L-aspartyl-D-amino acid dipeptides. 4,797,298, Cl. 426-548.000.

Brenza, James G., to International Business Machines Corporation. Variable address mode cache. 4,797,814, Cl. 364-200.000.

Bretz, Philip E.; Sawtell, Ralph R.; and Hunt, Warren H., Jr., to Aluminum Company of America. Aluminum-lithium alloys having improved corrosion resistance and method. 4,797,165, Cl. 148-12.70A.

Bridgestone Corporation: *See*—
Kawabata, Misao; and Kobayashi, Tetsuro, 4,796,683, Cl. 152-209.00R.

Brisson, Alfred G.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,796,614, Cl. 128-200.140.

British Aerospace Public Limited Company: *See*—
Powell, John H., 4,797,839, Cl. 364-554.000.

British Steel Corporation: *See*—
Liggins, Brian D.; Round, Timothy S.; Welch, Stuart J.; and Reynolds, Gordon F., 4,796,923, Cl. 285-27.000.

British Telecommunications plc: *See*—
Reeve, Michael H.; and Cassidy, Stephen A., 4,796,970, Cl. 350-96.230.

Brocks, Dietrich: *See*—
Teetz, Volker; Henke, Stephan; Brocks, Dietrich; Hanauske-Abel, Hartmut; and Gunzler, Volkmar, 4,797,471, Cl. 514-18.000.

Brockway, Brian P.: *See*—
Mills, Perry A.; and Brockway, Brian P., 4,796,641, Cl. 128-748.000.

Brodling, Gunter; Feyerabend, Franz; Hubert, Peter; Krahling, Franz; Peitz, Wolfgang; Sewing, Karlernst; and Schnelle, Diethard, to Westfalische Metall Industrie KG, Hueck & Co. Dimmed motor vehicle headlight. 4,797,790, Cl. 362-61.000.

Bromley, Robert L.: *See*—
Eastman, Lewis K., II; and Bromley, Robert L., 4,797,796, Cl. 362-199.000.

Bromley, Steven D.: *See*—
Milliorn, Gary W.; and Bromley, Steven D., 4,797,948, Cl. 455-54.000.

Bron, Dan, to Manisa Establishment. Drip emitter. 4,796,660, Cl. 137-504.000.

Bronson, Edward C.; Hartwell, Walter T.; Kleijn, Willem B.; and Prezas, Dimitrios P., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Digital speech vocoder. 4,797,926, Cl. 381-36.000.

Brooker, Ronald W.; Cohen, Bernard; and Jackson, David M., to Kimberly-Clark Corporation. Active particle-containing nonwoven material, method of formation thereof, and uses thereof. 4,797,318, Cl. 428-283.000.

Brooks, Norman D.; Kenyon, Rebecca A.; and Vanevenhoven, Peter W., to Eli Lilly and Company. Nicarbazin feed premix. 4,797,275, Cl. 424-78.000.

Brooks, Ralf M., to NCR Canada Ltd. - NCR Canada LTEE. Method and apparatus for thermal printer temperature control. 4,797,837, Cl. 364-519.000.

Broome, Andrew D. J.; and Egerton, Ian K., to Laporte Industries Limited. Process for preparing wood preservative compositions. 4,797,281, Cl. 424-133.000.

Brors, Daniel L.; Lane, Larry R.; Goldsborough, Mark W.; Samsel, Jason M.; van Mastrigt, Max; and Foster, Robert, to Varian Associates, Inc. Rapid thermal cvd apparatus. 4,796,562, Cl. 118-725.000.

Brother Kogyo Kabushikikaisha: *See*—
Hatta, Naoyuki; Yoshihara, Hideo; Izaki, Takeshi; Sawada, Akihiro; Yamamoto, Takemi; and Sangyoji, Kazuo, 4,797,107, Cl. 434-408.000.

Brown, Albert W. Two stage push-pull MOSFET power amplifier. 4,797,630, Cl. 330-264.000.

Brown, Arthur K., Jr., to Allied Signal Inc. Integrated anti-lock braking system. 4,796,958, Cl. 303-113.000.

Brown, Duncan W.: *See*—
Tom, Glenn M.; and Brown, Duncan W., 4,797,227, Cl. 252-194.000.

Brown, Jeffrey O.: *See*—
Nelson, Hilding E.; Brown, Jeffrey O.; and Zurn, Shayne M., 4,797,838, Cl. 364-551.010.

Brown, Michael J.; and Liu, Kou-Chang, to GAF Corporation. Process for the preparation of substituted diphenyl ethers. 4,797,505, Cl. 560-021.000.

Brown, Robert L.; and Richesson, Roger W., to B-Conn, Inc. Apparatus and process for measuring change of liquid level in storage tanks. 4,796,469, Cl. 73-49.200.

Brown & Root Vickers Technology: *See*—
Collins, Roger J.; and Hodgson, James R. T., 4,797,036, Cl. 105-224.000.

Brownell, David J., to Honeywell Inc. Fabrication of metal interconnect for semiconductor device. 4,797,375, Cl. 437-187.000.

Brownell, Keith H.: *See*—
Baker, Don R.; and Brownell, Keith H., 4,797,407, Cl. 514-346.000.
Baker, Don R.; Brownell, Keith H.; and Kezerian, Charles, 4,797,416, Cl. 514-485.000.

Brownline (U.K.) Limited: *See*—
Berrett, Thomas R., 4,796,539, Cl. 108-55.100.

Broze, Guy; and Bastin, Danielle, to Colgate-Palmolive Company. Nonaqueous liquid nonionic laundry detergent composition containing an alkali metal dithionite or sulfite reduction bleaching agent and method of use. 4,797,225, Cl. 252-105.000.

Bruggmann, Remy; and De Boer, Philipp, to Maillefer S.A. Installation and method for producing an optical conductor. 4,796,414, Cl. 57-6.000.

Bruhmann, Werner, to Robert Bosch GmbH. Centrifugal rpm governor for internal combustion engines. 4,796,581, Cl. 123-373.000.

Brun, Norbert: *See*—
Collot, Pierre; and Brun, Norbert, 4,797,797, Cl. 362-348.000.

Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexenonecarboxylic acid derivatives with herbicidal and plant growth regulating properties. 4,797,152, Cl. 71-118.000.

Bryant, James A., to Jabco Manufacturing, Inc. Disinfectant formulation and method of use. 4,797,420, Cl. 514-643.000.

BSRD Limited: *See*—
Meyer, Rudolph; and Specht, Martin, 4,796,918, Cl. 280-806.000.

Buchel, Karl H.: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Larssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,797,412, Cl. 514-383.000.

Buchelt, Benno, to Schatzmayr, Dieter. Lifting engine for VTOL aircrafts. 4,796,836, Cl. 244-23.00R.

Buhlmann, Hans: *See*—
Welzel, Dieter; and Buhlmann, Hans, 4,797,404, Cl. 514-288.000.

Bui, Vu Q.; Chan, Kevin K.; Hoffarth, Joseph G.; and Malueg, Vicki J., to International Business Machines Corporation. Plasma etch enhancement with large mass inert gas. 4,797,178, Cl. 156-643.000.

Bujese, David P., to Olin Hunt Specialty Products, Inc. Master and master transport assembly registration system. 4,797,714, Cl. 355-77.000.

Bukin, Boris A.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.

Bullock, James K.; Mann, L. Arnold; and Kuni, Daniel R., to Baxter Travenol Laboratories, Inc. Connector for esophageal probe. 4,796,615, Cl. 128-202.270.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Method for controlling movement in a single action forming press. 4,796,454, Cl. 72-350.000.

Bunge (Australia) Pty. Ltd.: *See*—
Patroni, Joseph J.; and Brandon, Malcolm R., 4,797,474, Cl. 530-351.000.

Burch, Hadley K.: *See*—
Burch, Lyndon W.; and Burch, Hadley K., 4,796,355, Cl. 29-622.000.

Burch, Lyndon W.; and Burch, Hadley K., to B/K Patent Development, Inc. Snap action devices and methods and apparatus for making same. 4,796,355, Cl. 29-622.000.

Burchick, Ronald W. Foot peg with light. 4,797,791, Cl. 362-72.000.

Burden, George S.: *See*—
McGovern, Terrence P.; and Burden, George S., 4,797,408, Cl. 514-315.000.

Burgin, Henry E., to Emhart Industries, Inc. Switch timing mechanism with serrated camstack. 4,797,515, Cl. 200-38.00R.

Burke, James E., to Scovill Fasteners Inc. One-way snap fastener. 4,796,339, Cl. 24-662.000.

Burlington Industries, Inc.: *See*—
Holder, Joseph P., 4,797,686, Cl. 346-1.100.
Holder, Joseph P.; Glenn, Michael I.; McConnell, Bobby L.; and Graham, Louis A., 4,797,687, Cl. 346-1.100.

Burns, Matthew J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Laser temperature modulation and detection method. 4,796,996, Cl. 356-372.000.

Burroughs Wellcome Co.: *See*—
Bair, Kenneth W., 4,797,495, Cl. 548-420.000.

Burt, John F.; Whynall, Jeffrey M.; Howe, Jonathan; Knott, Gilbert L.; and Harnvorakiat, Tavin, to Biosystems Inc. Testing device for respiratory protective devices. 4,796,467, Cl. 73-168.000.

Burt, Peter J., to General Electric. Pyramid processor for building large-area, high-resolution image by parts. 4,797,942, Cl. 382-41.000.

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Roggero, Arnaldo; Bertolini, Guglielmo; and Busetto, Carlo, 4,797,451, Cl. 525-332.900.

Bussey, Howard E., Jr.; Giacopelli, James N.; and Marcus, William S., to Bell Communications Research, Inc. Non-blocking, self-routing packet switch. 4,797,880, Cl. 370-60.000.

Butler, Robert B. Light-transmitting thermal barrier. 4,796,404, Cl. 52-789.000.

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Atkinson, Arthur H.; and Buttolph, David E., 4,796,602, Cl. 126-59.500.

Butts, Kenneth R.; and Wanamaker, Joseph L., to General Motors Corporation. Event sequenced clutch-to-clutch downshift for an electronically controlled transmission. 4,796,490, Cl. 74-866.000.

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Ferris, Donald L.; and Byrnes, Francis E., 4,797,064, Cl. 416-134.00A.

C. Behrens AG: *See*—
Otto, Gerhard; Rohrbach, Manfred; and Leupold, Gerald, 4,797,531, Cl. 219-121.670.

C.E.E. Compagnie Europeene des Emballages: *See*—
Schisler, Jacques, 4,796,759, Cl. 206-554.000.

C-I-L Inc.: *See*—
Manning, William, 4,796,748, Cl. 198-711.000.

Cabau, Michel: *See*—
Amen, Jean; and Cabau, Michel, 4,797,364, Cl. 435-243.000.

Cadillac Products, Inc.: *See*—
Pelfrey, Steven D., 4,796,540, Cl. 108-55.300.

Cafina AG: *See*—
Meier, Hermann; and Franzolin, Jean-Paul, 4,797,296, Cl. 426-433.000.

Caldwell, J. Brian; and Moore, Duncan T., to University of Rochester. Sol-gel method for making gradient-index glass. 4,797,376, Cl. 501-12.000.

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Avarado Cendan, Jose M.; and Campa Campa, Flor, 4,797,270, Cl. 423-625.000.

Campbell, Daniel: *See*—
Benkara, Ferial; and Campbell, Daniel, 4,797,846, Cl. 364-724.170.

Campbell, Roy: *See*—
Price, Anthony G.; Campbell, Roy; and Henson, Eric, 4,796,730, Cl. 188-71.600.

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Frigola Constansa, Jordi; Ribalta Baro, Jose M.; and Campon Pardo, Julio, 4,797,483, Cl. 544-49.000.

Candelas, Rodrigo A. Carousel portable pantry. 4,796,960, Cl. 312-305.000.

Cannon, Kenneth A., to Phillips Petroleum Company. Tube supports. 4,796,695, Cl. 165-159.000.

Canon Kabushiki Kaisha: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,299, Cl. 430-65.000.
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Kaneko, Shuzo; Toyono, Tsutomu; and Kanbe, Junichiro, 4,796,980, Cl. 350-350.00S.
Nakahara, Toshiaki; Ohsaki, Ichiro; Ushiyama, Hisayuki; Kiuchi, Masashi; Yamazaki, Masuo; Goseki, Yasuhide; and Ochi, Hisayuki, 4,797,344, Cl. 430-138.000.
Nishimura, Yukuo; Haruta, Masahiro; Hirai, Yutaka; Sakai, Kunihiro; and Matsuda, Hiroshi, 4,796,981, Cl. 350-353.000.
Nobutani, Toshiyuki, 4,797,873, Cl. 369-270.000.
Ohshima, Shigeru, 4,797,734, Cl. 358-55.000.
Oikawa, Katsuya; Egami, Hidemi; Saitor, Katuo; and Satomura, Hiroshi, 4,797,598, Cl. 315-85.000.
Sato, Chikara; Nakayama, Tadayoshi; Takahashi, Koji; and Sasatani, Tomohiko, 4,797,741, Cl. 358-138.000.
Sugishima, Kiyohisa; and Yamada, Masanori, 4,797,706, Cl. 355-14.00R.
Suzuki, Yoshiyuki; Funada, Masahiro; Sato, Mamoru; and Sato, Yukio, 4,797,945, Cl. 382-56.000.
Takayama, Makoto, 4,797,653, Cl. 341-51.000.
Tsuboyama, Akira, 4,796,979, Cl. 350-350.00S.
Tsuji, Sadahiko; and Inaba, Hiroyoshi, 4,797,700, Cl. 354-271.100.

Capaul, Raymond W. Demountable panel structure. 4,796,397, Cl. 52-144.000.

Capion, Robert L., to Sundstrand Corporation. Stator cooling for dynamoelectric machine. 4,797,588, Cl. 310-54.000.

Caple, Roderick. Apparatus for detecting basement water. 4,796,658, Cl. 137-312.000.

Capolupo, Janet D.; and Chucta, Thomas M., to Uniroyal Chemical Company, Inc. Polyethylene stabilized by mixture of hindered phenol and amine antioxidants. 4,797,511, Cl. 174-110.0PM.

Capps, C. D.: *See*—
Falk, R. A.; and Capps, C. D., 4,797,843, Cl. 364-713.000.

Capra, Silvano, to Manghen S.r.l. Steerable sled equipped with runner means. 4,796,902, Cl. 280-16.000.

Carburos Metalicos S.A.: *See*—
Mercader, Juan P.; and Villamanan, Pablo R., 4,797,141, Cl. 62-17.000.

Cardarelli, Donato: *See*—
Coccoli, Joseph D.; Stemniski, John R.; and Cardarelli, Donato, 4,796,968, Cl. 350-96.150.

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Sorbi, Robert T.; Caretta, Antonio; Cavaggioni, Andrea; and Marchesi Gastaldi, Liliana, 4,797,480, Cl. 536-27.000.

Carl Freudenberg, Firma: *See*—
Sciortino, Giacomo, 4,796,876, Cl. 267-140.100.

Carlberg, Kristine E.; and Lindsey, Carole B., to Eastman Kodak Company. Ice making method using ice nucleating microorganisms. 4,796,805, Cl. 239-2.200.

Carlin, Frank J.; and Wafford, Terrell F., to Baker Hughes Incorporated. Threaded connection for pipes and method of fabricating same. 4,796,928, Cl. 285-334.000.

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Bannister, A. Karen; Brandriff, Kristen; Carlotto, John A.; DiDonato, Richard J.; Haigh, Virginia; and Sirois, Edmond, 4,796,443, Cl. 63-14.500.

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Carreno, Diether E.; and Morgan, Peter J., to General Electric Company. Method and apparatus for monitoring turbomachine material. 4,796,465, Cl. 73-116.000.

Carrier Corporation: *See*—
Voorhis, Roger J.; and Palmer, John M., 4,796,436, Cl. 62-77.000.

Carroll, David T., to DCI Technology. Switching power supply VCO. 4,797,803, Cl. 363-95.000.

Carson, Donald G. Non-linear rotary drive apparatus. 4,796,478, Cl. 74-89.200.

Carson, James E.: *See*—
Frentrup, Mark A.; Gibson, Joseph R.; Carson, James E.; and Davis, Pauls, 4,797,229, Cl. 252-345.000.

Carter, Barrie J.; and Tratschin, Jon D., to United States of America, Health and Human Services. Adeno-associated virus as eukaryotic expression vector. 4,797,368, Cl. 435-320.000.

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Carter, Charles G.: *See*—
Lee, David L.; and Carter, Charles G., 4,797,147, Cl. 71-92.000.

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Casares, Pete P.: *See*—
Aguillen, Domingo V., Jr.; Casares, Pete P.; DeForrest, John E.; Green, Kevin C.; Kavanagh, Rocque A.; Wilkinson, Bryan; Marks, Marc K.; and Zuniga, Gerardo, 4,796,347, Cl. 29-280.000.

Casio Computer Co., Ltd.: *See*—
Hara, Kazuya, 4,797,542, Cl. 235-380.000.

Cassidy, Stephen A.: *See*—
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Caterpillar Inc.: *See*—
Fee, David M.; and Riediger, Craig W., 4,796,736, Cl. 192-4.00C.

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Sorbi, Robert T.; Caretta, Antonio; Cavaggioni, Andrea; and Marchesi Gastaldi, Liliana, 4,797,480, Cl. 536-27.000.

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Kauth, Hans-Herbert; and Itzel, Hanshelmut, 4,796,381, Cl. 43-124.000.

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Von Allmen, Martin; and Blatter, Andreas, 4,797,166, Cl. 148-13.100.

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Laurent, Yves; Verdier, Patrick; and Guyader, Jean, 4,797,377, Cl. 501-39.000.

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Francis, Daniel L., 4,797,388, Cl. 514-23.000.
Nitecki, Danute E.; and Moreland, Margaret, 4,797,491, Cl. 546-291.000.

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Beneteau, Christian; and Guerard, Norbert, 4,796,326, Cl. 15-250.420.

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Bui, Vu Q.; Chan, Kevin K.; Hoffarth, Joseph G.; and Malueg, Vicki J., 4,797,178, Cl. 156-643.000.

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Charbeneau, Rodney P. Pet transporting, restraining and exercising assembly. 4,796,565, Cl. 119-101.000.
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Large, Jean-Francois; and Guigon, Pierre F., 4,796,691, Cl. 165-104.160.
Charles Stark Draper Laboratory, Inc., The: *See*—
Coccoli, Joseph D.; Stemniski, John R.; and Cardarelli, Donato, 4,796,968, Cl. 350-96.150.
Chartrand, Raymond J.; and Deambrosio, Carlos A., to Electrovert Limited. Foam fluxer. 4,796,558, Cl. 118-74.000.
Chase Industries, Inc.: *See*—
Mayne, Jimmy, 4,796,765, Cl. 212-205.000.
Chastain, Lemuel J. Geodesic structure. 4,796,394, Cl. 52-81.000.
Chateignon, Claude: *See*—
Nguyen, Van T.; Chateignon, Claude; and Deschamps, Georges, 4,797,582, Cl. 307-475.000.
Chaussadas, Jean; and Le Bras, Philippe, to Mead Corporation, The. Open-ended multipak with carrying strap and method. 4,796,754, Cl. 206-434.000.
Cheek, Albert G.: *See*—
Pierce, William W.; June, George; Meadows, James M.; and Cheek, Albert G., 4,797,291, Cl. 426-63.000.
Chem-O Company, Inc.: *See*—
Lott, Gerald, 4,797,063, Cl. 415-116.000.
Chem Tec Equipment Corp.: *See*—
Custer, Craig S., 4,796,473, Cl. 73-308.000.
Chernomorsky, Simon A. Use of anorectal compositions. 4,797,392, Cl. 514-185.000.
Chiang, Tien-Hon; and Thatcher, Donald N., to Aerojet-General Corporation. Forming apparatus employing a shape memory alloy die. 4,797,085, Cl. 425-405.200.
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Process for the production of optical fiber preforms. 4,797,143, Cl. 65-3.120.
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Martorella, Romeo P.; and Chin, Jimmie, 4,797,829, Cl. 364-434.000.
Chino, Naoyoshi: *See*—
Shibata, Norio; Sato, Tsunehiko; Takeda, Hideo; and Chino, Naoyoshi, 4,796,557, Cl. 118-62.000.
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Ohbayashi, Keiji; Chino, Shigeo; Okumura, Mitsuhiro; and Onodera, Kaoru, 4,797,350, Cl. 430-380.000.
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Uomi, Kazuhisa; Yoshizawa, Misuzu; Ono, Yuichi; Chinone, Naoki; and Kajimura, Takashi, 4,797,891, Cl. 372-46.000.
Chism, Wayne R.; and Smeins, Larry G., to Hewlett-Packard Company. Programmatically generated in-circuit test for general purpose operational amplifiers. 4,797,627, Cl. 330-2.000.
Chisso Corporation: *See*—
Goto, Yasuyuki; Sugimori, Shigeru; and Ogawa, Tetsuya, 4,797,228, Cl. 252-299.630.
Cho, Hyun J., to T. D. Williamson, Inc. Foam pig with textured surface. 4,797,239, Cl. 264-45.500.
Choi, Young S. Portable golfball teeing device. 4,796,893, Cl. 273-201.000.
Choisnet, Joel, to Thomson-CSF. Device for measuring the ratio of two low value capacities. 4,797,603, Cl. 324-60.0CD.
Chou. Chin-Liang: *See*—
Fleming, Hubert L.; Edd, Jon F.; Pearson, Alan; Chou, Chin-Liang; Kono, Hisashi O.; and Huang, Ching-Chung, 4,797,271, Cl. 423-625.000.
Christiany, Charles, to Societe Lorraine de Laminage Continu - Sollac. Multi-purpose draining valve. 4,796,665, Cl. 137-614.130.
Christy, Marcia E.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,797,413, Cl. 514-432.000.
Chrysler Motors Corporation: *See*—
Miller, Paul D., 4,796,464, Cl. 73-115.000.
Chrysler, Ralph W., to Row Runner Corp. of America. Apparatus for removing plastic film from raised plant beds. 4,796,711, Cl. 171-1.000.
Chubb, Charles F.: *See*—
DiMatteo, Paul; Chubb, Charles F.; and Senator, Stewart, 4,796,313, Cl. 5-81.00R.
Chucta, Thomas M.: *See*—
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Brunner, Hans-Georg, 4,797,152, Cl. 71-118.000.
Finter, Jurgen, 4,797,347, Cl. 430-311.000.
Steinberg, David H.; and Cortolano, Frank, 4,797,218, Cl. 252-47.500.
Cibie Projecteurs: *See*—
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Cincinnati Incorporated: *See*—
Dressing, Paul A.; and Macdonald, John L., 4,797,831, Cl. 364-474.070.
Cities Service Oil and Gas Corporation: *See*—
Sandiford, Burton B.; and Zillmer, Roger C., 4,796,700, Cl. 166-270.000.
Clairol Incorporated: *See*—
Santhouse, Daniel; and Reeves, Kevin E., 4,797,533, Cl. 219-225.000.
Clare, Michael: *See*—
Pitzele, Barnett S.; Hansen, Donald W., Jr.; Hamilton, Robert W.; Pilipauskas, Daniel R.; and Clare, Michael, 4,797,470, Cl. 530-331.000.
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Yamaguchi, Katsumi; Yokoi, Syouichiro; Kanai, Takao; and Yoshikawa, Kikuo, 4,797,758, Cl. 360-85.000.
Clark, Michael R.; Kuipper, Gerald J.; Monson, Donald B.; and Tringali, Dominick, to Square D Company. Moldings for isolation switch and fuse clips. 4,797,516, Cl. 200-51.00R.
Clark, Richard E., to Continental Group, Inc., The. Plastic container and method of forming same. 4,796,766, Cl. 215-1.00C.
Clarke, David: *See*—
Blake-Coleman, Barry; and Clarke, David, 4,796,468, Cl. 73-32.00A.
Clarke, William L. Super resolving partial wave analyzer-transceiver. 4,797,923, Cl. 381-31.000.
Clausen, Thomas; and Konrad, Eugen, to Wella Aktiengesellschaft. Oxidative hair dye composition based on 4-amino-2-aminomethylphenols. 4,797,130, Cl. 8-421.000.
Clayton, Wilson A.; and Babilius, Algis P. J., to General Signal Corporation. Signal conditioning circuit. 4,797,774, Cl. 361-86.000.
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Koenig, Robert G., 4,796,474, Cl. 73-862.650.
Cleverley, John A., to Exxon Chemical Patents Inc. Overbased additives. 4,797,217, Cl. 252-42.700.
Cline, Richard S.: *See*—
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Cobb, Michael E.: *See*—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,797,283, Cl. 424-443.000.
Cocco, Vincent L., to Polaroid Corporation. Telescoping disk drive assembly. 4,797,761, Cl. 360-99.060.
Coccoli, Joseph D.; Stemniski, John R.; and Cardarelli, Donato, to Charles Stark Draper Laboratory, Inc., The. Single-mode optical-fiber directional coupler. 4,796,968, Cl. 350-96.150.
Cockerham, Kevin, to Lucas Industries Public Limited Company. Angular position detector. 4,797,827, Cl. 364-431.030.
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Kees, George, Jr., 4,796,625, Cl. 128-325.000.
Coelho, Urban J., to Nabisco Brands, Inc. Reheatable, resealable package for fried food. 4,797,010, Cl. 383-109.000.
Coenen, Hubert: *See*—
Wetzel, Rolf; Coenen, Hubert; and Kreuch, Winfried, 4,797,198, Cl. 208-181.000.
Coetzer, Johan; and Wedlake, Roger J., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,797,333, Cl. 429-103.000.
Coffman, Allen B.: *See*—
Shoup, Gary L.; Coffman, Allen B.; and Fix, Robert L., 4,797,057, Cl. 414-563.000.
Coffman, Timmie M.: *See*—
Schreck, John F.; Coffman, Timmie M.; and Wilmoth, David D., 4,797,857, Cl. 365-203.000.
Cogema-Compagnie Generale des Matieres Nucleaires: *See*—
Tsitsichvili, Jean, 4,797,248, Cl. 376-261.000.
Cogswell, Sarah L.; and Edington, Frederick R., II. Flag device such as a dive flag device and floats for use therewith. 4,796,553, Cl. 116-173.000.
Cohen, Bernard: *See*—
Brooker, Ronald W.; Cohen, Bernard; and Jackson, David M., 4,797,318, Cl. 428-283.000.
Cohn, Moritz. Articulator for dental model. 4,797,097, Cl. 433-64.000.
Coker, Wesley F. Fuel saving method and device for internal combustion engines. 4,796,596, Cl. 123-593.000.
Cole, Gary W.: *See*—
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Colgate-Palmolive Company: *See*—
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Collett, John H.: *See*—
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Collins, Arthur A., to Arthur A. Collins, Inc. Dynamically reconfigurable time-space-time digital switch and network. 4,797,589, Cl. 370-63.000.
Collins, Roger J.; and Hodgson, James R. T., to Brown & Root Vickers Technology. Marine tether anchoring device. 4,797,036, Cl. 105-224.000.
Collot, Pierre; and Brun, Norbert, to Cibie Projecteurs. Dipped headlamp for motor vehicles. 4,797,797, Cl. 362-348.000.

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Woodcock, William F.; and Kline, Loren H., 4,796,593, Cl. 123-518.000.
Combes, Gilles; and Delage, Germain, to Alsthom. Automatic level-regulating sluice. 4,797,027, Cl. 405-92.000.
Combustion Engineering, Inc.: *See*—
Wentzell, Timothy H., 4,797,613, Cl. 324-220.000.
Comera, Jean; Contamin, Pierre; Favier, Jean-Jacques; and Marquet, Guy, to Commissariat a l'Energie Atomique. Process and apparatus for the continuous checking of the supermelting of the solidification front of a monocrystal during formation and application to the checking of the growth of a crystal. 4,797,174, Cl. 156-616.100.
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Lannes, Andre , 4,797,701, Cl. 354-288.000.
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Moret, Jacques; Fosset, Jean-Maurice; Couturier, Jacques; and Viard, Noel, 4,797,524, Cl. 219-10.690.
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Con/Span Culvert Systems, Inc.: *See*—
Lockwood, William D., 4,797,030, Cl. 405-125.000.
Concept, Inc.: *See*—
Trott, Arthur F.; and Marchand, Sam R., 4,796,624, Cl. 128-316.000.
Congdon, Danny D. Agricultural wagon protective cover. 4,796,945, Cl. 296-100.000.
Conine, James W.; and Stowers, Julian L., to Eli Lilly and Company. Stabilized pergolide compositions. 4,797,405, Cl. 514-288.000.
Conlow, Frank J., to Transamerica DeLaval Inc. Turbine blade retainer. 4,797,065, Cl. 416-220.00R.
Conn, James K.: *See*—
Guler, Michael G.; Patel, Sharadchandra D.; Conn, James K.; and Foster, Marcus L., 4,797,685, Cl. 343-912.000.
Connell, G. A. Neville; and Kowalski, Daniel C., to Xerox Corporation. Method of utilizing a multiple emitter solid state laser in a raster output scanner (ROS). 4,796,964, Cl. 350-6.800.
Connor, William G.; and Coliandris, Chris, to GTE Products Corporation. Reflector lamp. 4,797,794, Cl. 362-226.000.
Conoco Inc.: *See*—
Hunter, Andrew F., 4,797,035, Cl. 405-205.000.
Consolidation Coal Company: *See*—
Nelson, Michael G.; and Oblad, Hayward B., 4,797,550, Cl. 250-227.000.
Oblad, Hayward B.; Nelson, Michael G.; and Sandbrook, Thomas D., 4,797,559, Cl. 250-227.000.
Constansa, Jordi F.; Pinol, Augusto C.; and Corominas, Juan P., to Provesan S.A. Process for the preparation of oxazinobenzothiazine 6,6-dioxide derivatives. 4,797,482, Cl. 544-33.000.
Construction Forms, Inc.: *See*—
Klemm, Robert E.; and Lehnhardt, Gary D., 4,796,814, Cl. 239-430.000.
Contamin, Pierre: *See*—
Comera, Jean; Contamin, Pierre; Favier, Jean-Jacques; and Marquet, Guy, 4,797,174, Cl. 156-616.100.
Continental Group, Inc., The: *See*—
Clark, Richard E., 4,796,766, Cl. 215-1.00C.
Continental White Cap, Inc.: *See*—
Begley, Douglas G., 4,796,770, Cl. 215-252.000.
Cook, Jeffrey A., to Nicor, Inc. Method and apparatus for connecting electrical conductors together. 4,797,509, Cl. 174-84.00C.
Cool, Donald L.: *See*—
Mrotz, Walter C., III; Cool, Donald L.; and Liebertz, Fred C., 4,796,950, Cl. 297-302.000.
Cooper Companies, Inc., The: *See*—
Krasner, Gary N.; and Berkman, John W., 4,796,623, Cl. 128-305.000.
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Cooper, Robert. Portable cooking grill device. 4,796,599, Cl. 126-30.000.
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Cowles, Richard A.; Georgalas, Nick; and Shah, Shailesh C., to BASF Corporation. Waterborne pigmented acrylic hydrosol coating composition and process. 4,797,444, Cl. 524-501.000.
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Caruthers, Edward B., Jr., 4,797,553, Cl. 250-327.200.
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St. Onge, Henri S., 4,796,669, Cl. 138-97.000.
Duret, Pierre. Device and method for injecting fuel into an engine, assisted by compressed air or gas. 4,796,594, Cl. 123-531.000.
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Jorgensen, Paul R., 4,797,785, Cl. 361-402.000.
Durst, Robert T., Jr.: *See—*
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Agostinelli, John A.; and Mir, Jose M., 4,797,694, Cl. 346-160.000.
Carlberg, Kristine E.; and Lindsey, Carole B., 4,796,805, Cl. 239-2.200.
DeJager, Donald; and Kesaler, David, 4,796,962, Cl. 350-6.800.
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Kasiske, W. Charles, Jr.; and Fiske, John M., 4,797,708, Cl. 355-15.000.
Mura, Albert J.; and Merkel, Paul B., 4,797,357, Cl. 435-34.000.
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Robello, Douglas R.; Ulman, Abraham; and Willand, Craig S., 4,796,971, Cl. 350-96.340.
Shaw, James D., 4,797,257, Cl. 422-65.000.
Tamary, Ernest J., 4,796,880, Cl. 271-311.000.
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Stinson, John L., Jr.; and Henley, George W., Jr., 4,796,333, Cl. 17-76.000.
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Diel, Robert M., 4,796,860, Cl. 251-297.000.
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Eaton, Earl V. Folding step ladder. 4,796,727, Cl. 182-168.000.
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Eckenrod, John J.; Rhodes, Geoffrey O.; Pinnow, Kenneth E.; and Royer, William E., to Crucible Materials Corporation. Corrosion-resistant, low-carbon plus nitrogen austenitic stainless steels with improved machinability. 4,797,252, Cl. 420-42.000.
Eckenrode, Robert T.; and Dillon, Joseph J., Jr., to Eaton Corporation. Headlight position adjustment assembly. 4,796,494, Cl. 81-484.000.
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Terasaki, Paul I.; Loon, Jimmy; Hardiwidjaja, Steven; and El-Awar, Nadim, 4,797,475, Cl. 530-387.000.
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Electrofilm, Inc.: *See*—
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Electrovert Limited: *See*—
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Elenbaas, George H. Mercury tilt switch and method of manufacture. 4,797,519, Cl. 200-226.000.
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Brooks, Norman D.; Kenyon, Rebecca A.; and Vanevenhoven, Peter W., 4,797,275, Cl. 424-78.000.
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Thakkar, Arvind L.; and Gibson, Lowell L., 4,797,286, Cl. 424-456.000.
Elisra Electronic Systems Ltd.: *See*—
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Elizabeth Arden Inc.: *See*—
Linn, Edwards E.; and York, Thomas O., 4,797,273, Cl. 424-59.000.
Eller, J. David; and Ponce, Juan E., to M & W Pump Corporation. Pumping system with desilting arrangement. 4,797,067, Cl. 417-43.000.
Ellion, M. Edmund; Donatelli, Philip A.; and Wolff, George, to Hughes Aircraft Company. Method for making solid element fluid filter for removing small particles from fluids. 4,797,175, Cl. 156-644.000.
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El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, to BBC Brown, Boveri Ltd. Free-running pressure wave supercharger driven by gas forces. 4,796,595, Cl. 123-559.200.
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ELP Products Limited: *See*—
Maciorewicz, Jacek J., 4,797,203, Cl. 209-211.000.
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Burgin, Henry E., 4,797,515, Cl. 200-38.00R.
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Enz, Ulrich E., to U.S. Philips Corporation. Magnetic head with magnetoresistive element. 4,797,766, Cl. 360-113.000.
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Erickson, Donald C. Nitrogen partial expansion refrigeration for cryogenic air separation. 4,796,431, Cl. 62-31.000.
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Etat Francais: *See—*
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Ethicon, Inc.: *See—*
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Farrar, Peter G. G.; Wright, Eric; and Peacock, Nicholas J., to Rolls-Royce plc. Intake for a turbopropeller gas turbine engine. 4,796,424, Cl. 60-268.000.
Farrell, Nicholas; Hacker, Miles P.; McCormack, John J.; and DeAlmeida, Sergio G., to University of Vermont and State Agricultural College. Bis-platinum complexes as chemotherapeutic agents. 4,797,393, Cl. 514-188.000.
Farro, Henry. Arrow rest. 4,796,597, Cl. 124-41.00A.
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Feamster, Kim L., to ITT Corporation. Test adapter for integrated circuit carrier. 4,797,118, Cl. 439-264.000.
Fee, David M.; and Riediger, Craig W., to Caterpillar Inc. Control mechanism for applying a brake and neutralizing a transmission of a vehicle. 4,796,736, Cl. 192-4.00C.
Feichtiger, Dieter: *See—*
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Fel-Pro Incorporated: *See—*
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Feldmann, John: *See—*
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Ference, Jonathan H.; Blonstein, Steven M.; Rowen, Michael J.; and Newman, Robert C., Jr., to Lutron Electronics Co., Inc. Power control circuit with phase controlled signal input. 4,797,599, Cl. 315-194.000.
Ferrante, Ronald A., to NCR Corporation. Compact laser scanner optical system. 4,797,551, Cl. 250-234.000.
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Finter, Jurgen, to Ciba-Geigy Corporation. Process for producing electrically conductive coating. 4,797,347, Cl. 430-311.000.

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Fischer, Manfred; Dussler, Klaus; Linke, Wilfried; and Hartmann, Werner, to Andreas Stihl. Motor-driven chain saw with a sprocket guide. 4,796,360, Cl. 30-384.000.

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Gee, Colin, 4,796,351, Cl. 29-455.100.

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Nguyen, Chinh K.; and Flicek, Charles A., 4,797,817, Cl. 364-200.000.

FMC Corporation: *See*—
Kuhn, James A., II, 4,796,341, Cl. 29-33.00P.

Foerg, Franz: *See*—
Schumann, Klaus; Guirr, Ortburg; Schulz, Paul; and Foerg, Franz, 4,797,231, Cl. 252-547.000.

Folger Adam Company: *See*—
Richards, James A.; and Stefanek, Ronald T., 4,797,779, Cl. 361-154.000.

Fombellida, Miguel. Electronic test fixture. 4,797,610, Cl. 324-158.00F.

Ford Motor Company: *See*—
Kesel, Thomas A.; and Paszko, Robert M., 4,796,934, Cl. 292-336.300.
Rutkowski, David J.; Ver Ploeg, Wendell J.; and Ross, Larry I., 4,796,712, Cl. 172-7.000.
Wolfe, Brian C.; and Wernholm, Thomas D., 4,796,579, Cl. 123-336.000.

Forest, Guy A. Alcoholic concentration indicator. 4,797,539, Cl. 235-85.00R.

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Lu, Chao-Hsiung, 4,796,391, Cl. 52-73.000.

Fornara, Dario: *See*—
Garlisi, Salvatore; Turchini, Luigi; Albanini, Aurelio; and Fornara, Dario, 4,797,481, Cl. 536-116.000.

Forrer, Douglas S., to Pac-Tec, Inc. Abrasive resistant pavement marker. 4,797,024, Cl. 404-16.000.

Forrest, John; Stewart, William; and Tulloch, Rory, to Drilex UK Limited. Drop ball sub-assembly for a down-hole device. 4,796,704, Cl. 166-317.000.

Forsyth, Maria K. Instructional globe. 4,797,102, Cl. 434-147.000.

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Moret, Jacques; Fosset, Jean-Maurice; Couturier, Jacques; and Viard, Noel, 4,797,524, Cl. 219-10.690.

Foster, Marcus L.: *See*—
Guler, Michael G.; Patel, Sharadchandra D.; Conn, James K.; and Foster, Marcus L., 4,797,685, Cl. 343-912.000.

Foster, Robert: *See*—
Brors, Daniel L.; Lane, Larry R.; Goldsborough, Mark W.; Samsel, Jason M.; van Mastrigt, Max; and Foster, Robert, 4,796,562, Cl. 118-725.000.

Foster Wheeler Energy Corporation: *See*—
Barkley, James D., 4,796,543, Cl. 110-173.00R.
Eisinger, Frantisek L., 4,796,690, Cl. 165-67.000.

Foussier, Jean P., to Armodel S.A. Anti-vibration mounting device for a compact disk player. 4,796,849, Cl. 248-619.000.

Fowler, David E., to Quadrex HPS, Inc. Method of and apparatus for cleaning garments and soft goods contaminated with nuclear, chemical and/or biological contaminants. 4,797,128, Cl. 8-137.000.

Fox, David A., to Westinghouse Electric Corp. Automatic paralleling of AC power sources. 4,797,570, Cl. 307-87.000.

Fraden, Jacob, to Thermoscan Inc. Infrared electronic thermometer and method for measuring temperature. 4,797,840, Cl. 364-557.000.

Framatome: *See*—
Moreau, Philippe, 4,797,250, Cl. 376-293.000.

Francis, Daniel L., to Cetus Corporation. Pharmaceutical compositions with galactitol as carrier. 4,797,388, Cl. 514-23.000.

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Franco, Grigoli; and Franco, Trabacchi, 4,797,295, Cl. 426-421.000.

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Helbig, Michael; and Staudt, Heinrich, 4,797,008, Cl. 384-49.000.

Franklin, Robert P.; and LaRocca, John, to Trans-World Marketing Corporation. Modular display. 4,796,763, Cl. 211-133.000.

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Bauer, Ralph; and Franklin, Rufus M., 4,797,269, Cl. 423-600.000.

Franzolin, Jean-Paul: *See*—
Meier, Hermann; and Franzolin, Jean-Paul, 4,797,296, Cl. 426-433.000.

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Kobbing, Heinz; and Gebhard, Hermann, 4,797,548, Cl. 250-221.000.

Fredriksson, Tommy: *See*—
Berthelius, Rolf; and Fredriksson, Tommy, 4,797,537, Cl. 219-528.000.

Freitag, Dieter: *See*—
Eckhardt, Volker; Dicke, Hans-Rudolf; and Freitag, Dieter, 4,797,467, Cl. 528-203.000.

French, Christopher W. Method of using portable apparatus for unitizing roof schemes. 4,796,350, Cl. 29-432.000.

French, Richard W.: *See*—
Mastromoro, John F.; French, Richard W.; and Strobert, Samuel S., 4,797,909, Cl. 379-67.000.

Frentrup, Mark A.; Gibson, Joseph R.; Carson, James E.; and Davis, Pauls, to BASF Corporation. Functional fluids containing associative polyether thickeners, certain dialkyl-dithiophosphates, and a compound which is a source of molybdate ion. 4,797,229, Cl. 252-345.000.

Fresenius AG: *See*—
Metzner, Klaus; Westphal, Detlef; Allendorfer, Wolfgang; Hahnel, Reinhard; and Polaschegg, Hans-Dietrich, 4,797,191, Cl. 204-411.000.
Polaschegg, Hans-Dietrich, 4,796,644, Cl. 128-760.000.

Freville, Robert; and Segor, Philip, to Kohler Co. Bathtub drain valve control and overflow plate. 4,796,310, Cl. 4-199.000.

Frew, Duncan W.; and Shadwick, Robert P., to Unisys Corp. Surface lubricants for disc record. 4,797,303, Cl. 427-131.000.

Frey, Albert. Apparatus for dispensing a deformable and flowable filling material. 4,796,679, Cl. 141-258.000.

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Bauer, Hans-Peter; Bauer, Hans J.; Stadelmann, Ludwig; and Frisch, Emil, 4,796,871, Cl. 267-64.110.

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Bauer, Hans-Peter; Bauer, Hans J.; Stadelmann, Ludwig; and Frisch, Emil, 4,796,871, Cl. 267-64.110.

Fritz, Ian J.: *See*—
Chaffin, Roger J., deceased; Dawson, Ralph; Fritz, Ian J.; Osbourn, Gordon C.; and Zipperian, Thomas E., 4,797,716, Cl. 357-22.000.

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Frohberger, Paul-Ernst: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.

Fryburg, George A.: *See*—
Rhodes, William H.; Wei, George C.; and Fryburg, George A., 4,797,238, Cl. 264-65.000.

Fuji-Davison Chemical, Ltd.: *See*—
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, 4,797,358, Cl. 435-176.000.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo; Endo, Hisao; Sata, Toshio; and Ishiguro, Masanori, 4,796,823, Cl. 242-71.800.
Akiyoshi, Nobuyasu; and Shimizu, Shigehisa, 4,797,691, Cl. 346-108.000.
Chikamasa, Hiroshi; Takagi, Akira; and Sakaguchi, Masaaki, 4,796,824, Cl. 242-76.000.
Hayashi, Ryoichi; Sakamoto, Kiichiro; and Terashita, Takaaki, 4,797,712, Cl. 355-38.000.
Igarashi, Akira; Shimomura, Akihiro; and Serizawa, Shinichiro, 4,797,384, Cl. 503-200.000.
Igarashi, Akira, 4,797,385, Cl. 503-207.000.
Ishikawa, Hiromi, 4,796,965, Cl. 350-6.800.
Ishikawa, Minoru, 4,797,710, Cl. 355-27.000.
Nakamura, Taku, 4,797,343, Cl. 430-138.000.
Oishi, Kengo; and Suzuki, Osamu, 4,797,768, Cl. 360-132.000.
Saitou, Mitsuo; Urabe, Shigeharu; and Ozeki, Katsuhisa, 4,797,354, Cl. 430-567.000.
Shibata, Norio; Sato, Tsunehiko; Takeda, Hideo; and Chino, Naoyoshi, 4,796,557, Cl. 118-62.000.
Sunagawa, Hiroshi; and Kamiyama, Kozi, 4,797,867, Cl. 369-45.000.
Takahashi, Kazuo, 4,797,644, Cl. 355-10.000.

Takahashi, Osamu; Ogawa, Tadashi; Sakai, Minoru; and Toriuchi, Masaharu, 4,797,349, Cl. 430-372.000.
Tanaka, Nobuyuki, 4,797,739, Cl. 358-133.000.
Tanaka, Nobuyuki, 4,797,944, Cl. 382-56.000.
Terashita, Takaaki; and Iijima, Hideaki, 4,797,713, Cl. 355-77.000.
Tsuyuki, Isao, 4,796,787, Cl. 222-64.000.
Uekusa, Tadashi; Koizumi, Takashi; and Amano, Nobuhiko, 4,797,193, Cl. 204-416.000.
Uenaka, Kazushige; Takase, Haruo; Utomo, Riuzi; and Akimoto, Masuo, 4,797,698, Cl. 354-275.000.
Yamada, umito; Kawasaki, Hiroshi; and Satake, Masaki, 4,797,353, Cl. 430-434.000.

Fuji Shashin Film Kabushiki Kaisha: *See*—
Inagaki, Yoshio; and Okazaki, Masaki, 4,797,476, Cl. 534-727.000.

Fuji Tekko Co., Ltd.: *See*—
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Fuji Xerox Co., Ltd.: *See*—
Ozawa, Takashi, 4,797,571, Cl. 307-311.000.
Tanaka, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; Murofushi, Toshiaki; and Kimura, Takaaki, 4,797,340, Cl. 430-109.000.
Yamada, Kunio; and Ito, Masao, 4,796,961, Cl. 350-6.800.

Fujii, Noriaki; Iwata, Takeshi; and Oikawa, Toshihiro, to Honda Giken Kogyo Kabushiki Kaisha. SOHC type internal combustion engine. 4,796,574, Cl. 123-90.230.

Fujii, Setsuro; Ogawa, Kazuo; Hamakawa, Toshihiro; and Muranaka, Yoshiyuki, to Taiho Pharmaceutical Company Limited. Sulfonic acid ester derivatives and process for preparing same. 4,797,502, Cl. 558-52.000.

Fujii, Takeshi: *See*—
Kegasa, Koyo; Murai, Takafumi; Yamanaka, Osamu; and Fujii, Takeshi, 4,797,637, Cl. 331-4.000.

Fujii, Tatsuo, to TDK Corporation. Casing for magnetic recording medium and preparation thereof. 4,796,753, Cl. 206-387.000.

Fujikawa, Yujiro: *See*—
Kimura, Masatoshi; Okuda, Hiroshi; Fujikawa, Yujiro; and Inomata, Tatsuaki, 4,796,411, Cl. 53-453.000.

Fujimoto, Akihiko: *See*—
Kiyokawa, Morio; and Fujimoto, Akihiko, 4,797,811, Cl. 364-200.000.

Fujimoto, Makoto: *See*—
Kaya, Toshio; and Fujimoto, Makoto, 4,797,177, Cl. 156-630.000.

Fujimoto, Sachito; and Yamashita, Kazunari, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. In English). Air-fuel ratio feedback control method for internal combustion engines. 4,796,589, Cl. 123-489.000.

Fujinaga, Ryuichi: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Okamoto, Masanori; Uchida, Itsuo; Umehara, Kazuyoshi; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,797,417, Cl. 514-473.000.
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; Okumura, Hiroyuki; and Nakaguchi, Osamu, 4,797,399, Cl. 514-253.000.

Fujita, Tetsuya: *See*—
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, 4,797,695, Cl. 346-160.000.

Fujitsu Limited: *See*—
Arii, Katsuyuki, 4,797,054, Cl. 414-217.000.
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Miyazawa, Hideo; Andoh, Ikuhiro; Koyama, Hiromichi; and Kobayashi, Mitsuru, 4,797,119, Cl. 439-395.000.
Shimanuki, Haruki; Miyake, Katsuya; Akima, Hideo; and Hoashi, Akira, 4,797,825, Cl. 364-426.020.

Fujiwaki, Kazuo: *See*—
Sato, Koji; Kurakake, Masahiro; and Fujiwaki, Kazuo, 4,797,940, Cl. 382-9.000.

Fujiwara, Akira: *See*—
Matsubara, Toshihiko; and Fujiwara, Akira, 4,796,575, Cl. 123-90.440.

Fujiwara, Masanori: *See*—
Iino, Syuji; Hotomi, Hideo; Saeki, Noboru; Fujiwara, Masanori; Uchino, Fumiko; and Osawa, Izumi, 4,797,338, Cl. 430-58.000.

Fujiwara, Mikio: *See*—
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Fukuda, Yoshiaki; Miyasaka, Takeshi; Matsumoto, Iori; Kato, Nobukatsu; and Ema, Kenji, to Mitsui Toatsu Chemicals, Incorporated. Method for shaping thermosetting resins. 4,797,242, Cl. 264-108.000.

Fukui, Akira: *See*—
Furukawa, Yasuo; Yamazaki, Katsuyuki; Hosaka, Takemi; and Fukui, Akira, 4,797,931, Cl. 351-56.000.

Fukukawa, Kiyofumi: *See*—
Shuto, Satoshi; Ito, Hiromichi; Fukukawa, Kiyofumi; Sakakibara, Hideo; and Tsujino, Masatoshi, 4,797,479, Cl. 536-27.000.

Fukukawa, Noboru: *See*—
Sasaki, Hiroaki; Hasegawa, Kazuo; Fukukawa, Noboru; and Yata, Masanori, 4,797,769, Cl. 360-99.080.

Fukuma, Yasufumi; Oana, Yoshinori; and Arai, Akihiro, to Tokyo Kogaku Kikai Kabushiki Kaisha. Opthalmological measuring apparatus. 4,796,989, Cl. 351-212.000.

Fukunishi, Yoshihiro: *See*—
Nakamura, Yoshinori; Koga, Kouhei; Kosuge, Satoru; and Fukunishi, Yoshihiro, 4,797,084, Cl. 425-533.000.

Fukushima, Danji: *See*—
Ariga, Toshiaki; Koshiyama, Ikunori; and Fukushima, Danji, 4,797,421, Cl. 514-844.000.

Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Flywheel assembly. 4,796,740, Cl. 192-30.00V.

Fukushima, Yaichi: *See*—
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, 4,797,358, Cl. 435-176.000.

Fukutomi, Hisao; Tuchiya, Takanori; Yamamoto, Takeshi; Konishi, Takeshi; and Hamasaki, Iseo, to Mazda Motor Corporation. Convertible vehicle body structure having a rear seat. 4,796,943, Cl. 296-65.100.

Fukuyama, Keiji: *See*—
Saito, Masato; Fukuyama, Keiji; Ishida, Masako; Watanabe, Keiji; Kamata, Toyokazu; and Sano, Kinjiro, 4,797,593, Cl. 313-346.00R.

Fuller, Roger W.; and Bingham, David, to Maxim Integrated Products, Inc. Integrated dual charge pump power supply including power down feature and rs-232 transmitter/receiver. 4,797,899, Cl. 375-7.000.

Fulton, David A.; and Boen, Jerry D., to Metal Building Components Incorporated. Articulating roofing panel clip. 4,796,403, Cl. 52-713.000.

Funada, Masahiro: *See*—
Suzuki, Yoshiyuki; Funada, Masahiro; Sato, Mamoru; and Sato, Yukio, 4,797,945, Cl. 382-56.000.

Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,797,321, Cl. 428-328.000.

Furcht, Leo T.: *See*—
Tarsio, Joseph F.; and Furcht, Leo T., 4,797,473, Cl. 530-387.000.

Furugen, Munekatsu: *See*—
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.

Furuhashi, Takeshi; and Kamei, Yoshio, to Kabushiki Kaisha Toshiba. Plural polyphase inverter units having toned input filters. 4,797,801, Cl. 363-43.000.

Furukawa, Takemitsu, to Honda Giken Kogyo Kabushiki Kaisha. Saddle-seated vehicles. 4,796,901, Cl. 280-5.00A.

Furukawa, Tatsuya, to Ricoh Company, Ltd. Multi-nozzle ink-jet printer. 4,797,688, Cl. 346-75.000.

Furukawa, Yasuo; Yamazaki, Katsuyuki; Hosaka, Takemi; and Fukui, Akira, to Kokusai Denshin Denwa Co., Ltd.; and NEC Corporation. Audio frequency signal identification apparatus. 4,797,931, Cl. 351-56.000.

Furushima, Kiyoshi; Haratoh, Kazunori; and Matsuo, Hideshige, to Hitachi Metals, Ltd. Protective tube for thermocouple and method of producing same. 4,796,671, Cl. 138-140.000.

Furutani, Kiyohiro: *See*—
Matsumoto, Noriaki; Mashiko, Koichiro; Arimoto, Kazutami; Furutani, Kiyohiro; and Matsuda, Yoshio, 4,797,001, Cl. 365-189.000.

Furuya, Shuji: *See*—
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.

Futaba, Takeshi; and Noguchi, Masahiko, to Koyo Jidoki Kabushiki Kaisha. Hydrsulic pressure reaction device in a power steering device. 4,796,715, Cl. 180-143.000.

G-C Toshi Kogyo Corporation: *See*—
Ito, Toshio; Miwa, Takashi; and Yamagishi, Fujio, 4,797,096, Cl. 433-26.000.

G. D. Searle & Co.: *See*—
Pitzele, Barnett S.; Hansen, Donald W., Jr.; Hamilton, Robert W.; Pilipauskas, Daniel R.; and Clare, Michael, 4,797,470, Cl. 530-331.000.

G & G Intellectual Properties, Inc.: *See*—
Gearin, Peter; and Leech, Everett A., 4,797,049, Cl. 414-400.000.

G. M. Holding Corp.: *See*—
Stites, George M., III, 4,797,949, Cl. 455-230.000.

G & S Metal Product Company, Inc.: *See*—
Spirk, John W.; Nottingham, John R.; and Kalman, Jeffrey M., 4,796,784, Cl. 222-80.000.

Gabel, Robert K.; and Law, Robert E., to Nalco Chemical Company. Compositions for agglomerating solid contaminants in well fluids and methods for using same. 4,796,703, Cl. 166-312.000.

Gabizon, Alberto: *See*—
Barenholz, Yechezkel; and Gabizon, Alberto, 4,797,285, Cl. 424-450.000.

GAF Corporation: *See*—
Brown, Michael J.; and Liu, Kou-Chang, 4,797,505, Cl. 560-021.000.
De Thomas, Waldo; and Taylor, Paul D., 4,797,382, Cl. 502-245.000.

Gaibotti, Maurizio: *See*—
Aguti, Alberto; Gaibotti, Maurizio; and Masina, Vittorio, 4,797,584, Cl. 307-594.000.

Galla, Edward A.: *See*—
Andrew, Gary D.; Galla, Edward A.; and Ricci, Robert L., 4,797,240, Cl. 264-46.400.

Galle, Edward M., Jr.: *See*—
Cowan, William S.; and Galle, Edward M., Jr., 4,797,029, Cl. 405-170.000.

Galvin, Mark W., to Marquardt Company, The. Projectile. 4,796,835, Cl. 244-3.290.

Gambro AB: *See*—
Orndal, Carl-Henry; Gummesson, Bengt-Ake G.; and Ericson, Bjorn-Inge, 4,797,655, Cl. 340-521.000.
Gano, John C., to Otis Engineering Corporation. Landing nipple and plug. 4,796,698, Cl. 166-135.000.
Gant, Eugene; and Spangler, Richard. Workpiece holding assembly for a chuck. 4,796,900, Cl. 279-123.000.
Garduno, Stephanie. Portable infant furniture. 4,796,314, Cl. 5-98.00A.
Garland, Steven B.; and Warren, Thomas C., to W. R. Grace & Co. Process for enhanced orientation of polymeric films. 4,797,235, Cl. 264-22.000.
Garlisi, Salvatore; Turchini, Luigi; Albanini, Aurelio; and Fornara, Dario, to Raffineria Olii Lubrificanti "R.O.L." S.p.A. Surfactants derived from di- or tri-carboxylic hydroxy-acids. 4,797,481, Cl. 536-116.000.
Garneau, Jocelyn C. Railing structure. 4,796,866, Cl. 256-59.000.
Garnreiter, Franz. Apparatus for delivering a measured amount of a low-boiling liquefied gas. 4,796,434, Cl. 62-55.000.
Garraffa, Dean R., to Undersea Industries, Inc. Breathing regulator apparatus. 4,796,618, Cl. 128-204.260.
Gaspar, Alexandre M.: *See*—
Teodorescu, Marius C.; and Gaspar, Alexandre M., 4,797,363, Cl. 435-235.000.
Gatan Inc.: *See*—
Swann, Peter R.; and Jones, Joseph S., 4,797,261, Cl. 422-102.000.
Gausepohl, Hermann: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; and Schlemmer, Lothar, 4,797,453, Cl. 525-397.000.
Gavagan, James A.: *See*—
Lobanoff, Mark; and Gavagan, James A., 4,796,944, Cl. 296-97.500.
Gayso, Donald W. Centrifugal casting machine with venturi actuated vacuum venting. 4,796,686, Cl. 164-287.000.
Gearin, Peter; and Leech, Everett A., to G & G Intellectual Properties, Inc. System for loading motor vehicles into standard cargo-carrying enclosures. 4,797,049, Cl. 414-400.000.
Gebhard, Hermann: *See*—
Kobbing, Heinz; and Gebhard, Hermann, 4,797,548, Cl. 250-221.000.
Gee, Colin, to Flexitallic Limited. Gaskets. 4,796,351, Cl. 29-455.100.
Gelfman, Stanley. Cable reel. 4,796,830, Cl. 242-117.000.
Geller, Herbert. Muscle-power-driven vehicle. 4,796,907, Cl. 280-220.000.
General Dynamics, Pomona Division: *See*—
Piesik, Edward T., 4,796,510, Cl. 89-1.816.
General Electric: *See*—
Burt, Peter J., 4,797,942, Cl. 382-41.000.
General Electric Company: *See*—
Boyd, Ronald J.; Law, Wing; and Wilson, Gary L., 4,796,632, Cl. 128-662.030.
Carreno, Diether E.; and Morgan, Peter J., 4,796,465, Cl. 73-116.000.
Csillag, Frank J., 4,797,326, Cl. 428-552.000.
Dholakia, Anil R.; and Trager, Louis, 4,797,728, Cl. 357-81.000.
Dumoulin, Charles L., 4,796,635, Cl. 128-653.000.
Fritzsche, Harold L., 4,796,451, Cl. 72-131.000.
Hsu, Sheng T., 4,797,721, Cl. 357-23.700.
Knapp, Malcolm H.; and Sonder, Gerhard, 4,796,721, Cl. 180-294.000.
Komanduri, Ranga, 4,797,138, Cl. 51-293.000.
Lievestro, Louis; Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; and Wakeman, Thomas G., 4,796,423, Cl. 60-39.330.
General Electric Company, p.l.c., The: *See*—
Heard, Maurice C., 4,797,640, Cl. 332-7.510.
Jackson, Michael C., 4,797,844, Cl. 364-724.010.
General Foods Corporation: *See*—
Evans, David N.; Fairchild, Charles L.; Kramer, Karl C.; Spruill, John C.; Wansor, Gerard J.; and Wood, Robert W., 4,797,293, Cl. 426-330.300.
General Motors Corporation: *See*—
Anderson, Russell C., Jr., 4,796,896, Cl. 277-181.000.
Baynes, Dennis, 4,796,930, Cl. 292-58.000.
Butts, Kenneth R.; and Wanamaker, Joseph L., 4,796,490, Cl. 74-866.000.
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Amos, Barry L.; Sapelak, Ronald; and Vanderweg, Peter, 4,796,480, Cl. 74-483.00R.
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Gordon, Michael D.; and Long, Norris R. Method and apparatus for measuring soft contact lenses. 4,796,991, Cl. 356-125.000.
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Lach, Lawrence E.; and Ohoka, Mikiharu, 4,797,565, Cl. 307-450.000.
Goulter, Victor H. Ergonomic cane having oval, tapered short handle and triangular shank for easier control with more comfortable grip. 4,796,648, Cl. 138-65.000.
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Gowdy, Wilford B., Jr. Combination safety glasses. 4,796,986, Cl. 351-57.000.
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Greenberg, Ilan. Variable-spray shower head. 4,796,815, Cl. 239-477.000.
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Grimm, Stefan; Schatzle, Michael; and Stahr, Fritz, to Teroson GmbH. Two-component material and the use thereof. 4,797,463, Cl. 528-60.000.
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Grollier, Jean F.; and Dubief, Claude, to L'Oreal. Composition and process for treating keratinic substances with at least one anionic polymer and at least one quaternized protein. 4,796,646, Cl. 132-202.000.
Grollier, Jean-Francois, to L'Oreal. Device for preparing and dispensing a product consisting of two components and the corresponding process. 4,796,812, Cl. 239-303.000.
Gromelski, Stanley J., Jr.: *See*—
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Grossi, Lucio. Compact automatic coffee-making machine more particularly for domestic use. 4,796,521, Cl. 99-287.000.
Gruchalla, Michael E.; and Koller, David C. Distributed push-pull amplifier. 4,797,628, Cl. 330-54.000.
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Rhodes, William H.; Wei, George C.; and Fryburg, George A., 4,797,238, Cl. 264-65.000.
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Gueldenzopf, Thomas D., to S. C. Johnson & Son, Inc. Polymer sheet for delivering laundry care additive and laundry care product formed from same. 4,797,221, Cl. 252-95.000.
Gueli, Carmen, to Van Wormer Management Corporation. Fusible link construction. 4,796,420, Cl. 59-93.000.
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Gueret, Jean-Louis, to L'Oreal. Applicator unit for a liquid, pasty or pulverulent product. 4,796,647, Cl. 132-320.000.
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Gundlach, Hans-Werner; and Jacob, Friedrich, to Bego Bremer Goldschagerei Wilh. Herbst GmbH & Co. Method for controlling the melting and casting process in precision casting, particularly for dental engineering, and arrangement for carrying out the method. 4,796,688, Cl. 164-457.000.
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Gyorgy, Ernst M.; Heilman, Frances; and Johnson, David W., Jr., to American Telephone and Telegraph Company, AT&T Bell Labs. Superconductor-magnet induced separation. 4,797,386, Cl. 505-1.000.
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Habig, Klaus; Taschner, Wolfgang; and Wolfle, Wilfried, to Aesculap-Werke AG vormals Jetter & Scheerer. Locking mechanism. 4,796,778, Cl. 220-315.000.
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Hagimoto, Hakumi; Kashima, Yutaka; Kondo, Norio; and Inoue, Masami, to Daiho Construction Co., Ltd. Caisson sinking method. 4,797,031, Cl. 405-133.000.
Hagin, Faust; Seethaler, Franz; Zelinka, Robert; and Stigimaier, Manfred, to Man Nutzfahrzeuge GmbH. Differential whose a ring gear is mounted in sound damping manner on its carrier. 4,796,488, Cl. 74-713.000.
Hagmann, Peter. Apparatus for punching out a part from a workpiece. 4,796,501, Cl. 83-535.000.
Hahne, Goran. Bass amplifier with high frequency response. 4,797,933, Cl. 381-96.000.
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Halbardier, Floyd A., deceased (by Halbardier, Anna L., heiress), to Baker Hughes Incorporated. Apparatus for setting, unsetting, and retrieving a packer or bridge plug from a subterranean well. 4,796,707, Cl. 166-387.000.
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Hall, Richard W., to Oilgear Towler, Inc. Double-acting forging hammer and method. 4,796,428, Cl. 60-413.000.
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Petak, Kevin R.; Soliman, Mohamed Y.; and Anderson, Merlin F., 4,797,821, Cl. 364-422.000.
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Halstrick, Robert T. Storage rack. 4,796,541, Cl. 108-111.000.
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Hamilton, Olivia B. Medical supply case. 4,796,790, Cl. 224-253.000.
Hamilton, Robert W.: *See*—
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Hammer, Floyd V.; and Harper, Brian, to Hammer, Floyd V. Method for recycling a beverage container. 4,797,237, Cl. 264-45.300.
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Hampton, Joe B., to Phillips Petroleum Company. Temperature control for a KOH treater. 4,797,199, Cl. 208-262.100.
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Hanauske-Abel, Hartmut: *See*—
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Handley, Jerome D., to Electrofilm, Inc. Temperature control apparatus for a waterbed. 4,797,536, Cl. 219-494.000.

Haneda, Satoshi: *See*—
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Hanel, Heinz: *See*—
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Hanneton, Jean-Jacques; and Sivori, Michel, to Regie Nationale des Usines Renault. Vibrating table for forming sand molds. 4,796,685, Cl. 164-203.000.
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Harada, Toshimitsu: *See*—
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Harms, Luhr: *See*—
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Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device having pushbutton controlled standby mode. 4,797,912, Cl. 379-79.000.
Hashimoto, Masashi, to Texas Instruments Incorporated. Memory cell for SRAM with a dielectric layer over a gate electrode to provide a parallel resistive and capacitive element. 4,797,725, Cl. 357-54.000.
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Hashizaki, Katsuo; Koyanagi, Toshio; and Morii, Atsushi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for treating combustion exhaust gas. 4,796,545, Cl. 110-216.000.
Hastings, Roger N.: *See*—
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Hata, Yasuhisa; and Akamatsu, Osamu, to Nippon Air Brake Co., Ltd. Spring brake cylinder. 4,796,513, Cl. 92-5.00R.
Hatanaka, Koichi; and Shibauchi, Yoshito, to Snow Brand Milk Products Co., Ltd. Sterilization method and apparatus therefor. 4,797,255, Cl. 422-28.000.
Hatch, Ronald R., to Magnavox Government and Industrial Electronics Company. Method and apparatus for automatic calibration of magnetic compass. 4,797,841, Cl. 364-571.040.
Hatcher, G. Stephen, to Boeing Company, The. Tracking loop having nonlinear amplitude filter. 4,797,635, Cl. 331-17.000.
Hatta, Naoyuki; Yoshihara, Hideo; Izaki, Takeshi; Sawada, Akihiro; Yamamoto, Takemi; and Sangyoji, Kazuo, to Brother Kogyo Kabushikikaisha. Copyable blackboard. 4,797,107, Cl. 434-408.000.
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Havel, Karel. Multicolor comparator of digital signals. 4,797,651, Cl. 340-146.200.
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Hayes, Leonard L. Continuously moving lathe knife. 4,796,681, Cl. 144-212.000.
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Heap, Ronald E., to Standard Havens, Inc. Apparatus for mixing asphalt compositions. 4,797,002, Cl. 366-25.000.
Heard, Maurice C., to General Electric Company, p.l.c., The. Apparatus for amplitude modulating the output of a laser diode or L.E.D. 4,797,640, Cl. 332-7.510.
Hebert, Michael R.; and Lauder, Arnold J., to Boeing Company, The. Filament preheat apparatus. 4,797,172, Cl. 156-425.000.
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Helbig, Michael; and Staudt, Heinrich, to Franke & Heydrich KG. Roller bearing for rotary or linear applications. 4,797,008, Cl. 384-49.000.
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Hermelin, Rene , to Services Equipments France (S.E.F.). Modulable oblique bin. 4,796,761, Cl. 211-11.000.
Herrick, Robert S.; and Webb, Gary E. Liquid-tight sealing device and method. 4,796,899, Cl. 277-228.000.
Herrnstadt, Corinna; and Soares, George G., to Mycogen Corporation. Cotton boll weevil, alfalfa weevil, and corn rootworm via contact with a strain of bacillus thuringiensis. 4,797,276, Cl. 424-84.000.
Herstad, Ola; and Olausson, Lars, to Gotaverken Energy Systems AB. Combustion plant including a circulation fluid bed. 4,796,546, Cl. 110-216.000.
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Heydrich, Hans, to United States of America, Army. Combustion chamber liner. 4,796,572, Cl. 123-41.420.
Heynatz, Johann T., to Dornier GmbH. Trailing edge flap operation in wings. 4,796,840, Cl. 244-215.000.
Hibbard, Bruce A., to H-Tech, Inc. Strap on drill paraphernalia holding system (DPHS). 4,797,040, Cl. 408-241.00R.
Hidano, Kengo; and Amano, Susumu, to Nippon Thomson Co., Ltd. Roller cage assembly for use in a bearing. 4,797,015, Cl. 384-580.000.
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Kawasaki, Yoshinobu; Niikawa, Ryo; and Ikeda, Yuzi, 4,796,346, Cl. 29-700.000.
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Yokoyama, Toshio; Shimane, Iwao; and Konno, Tsuneo, 4,796,354, Cl. 29-608.000.
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Brownell, David J., 4,797,375, Cl. 437-187.000.
Gonzalez, Manuel A.; and Hutchins, David L., 4,797,863, Cl. 367-157.000.
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Honorof, Frank D.; and Odenberg, Richard, to Transtector Systems, Inc. Spatial array filtering system for electrical devices. 4,797,773, Cl. 361-58.000.
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Horiuchi, Yutaka. Carrying case. 4,796,735, Cl. 190-109.000.
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Horton, M. Duane: *See*—
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Humphrey, Floyd B., to Sensormatic Electronics Corporation. Article surveillance marker capable of being deactivated by relieving the retained stress therein and method and system for deactivating the marker. 4,797,658, Cl. 340-551.000.

Humphrey, Theodore J., to Video Sound, Inc. Audio amplifier. 4,797,633, Cl. 330-297.000.

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Hunter, Andrew F., to Conoco Inc. Method of installing a template on the seafloor. 4,797,035, Cl. 405-205.000.

Hunter, Edwin J. Two-stage pop-up sprinkler. 4,796,809, Cl. 239-205.000.

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Igarashi, Tetsu, to Kabushiki Kaisha Toshiba. Cache memory control apparatus. 4,797,813, Cl. 364-200.000.

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Doyen, Hans H., 4,796,327, Cl. 15-340.300.
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Albert, Gregory P., 4,797,074, Cl. 418-41.000.
Ingeveld, Johannes W.; and Westerhof, Albert J., to U.S. Philips Corp. Electric lamp having a mirror-coated lamp vessel. 4,797,302, Cl. 427-107.000.
Ingham, Dan. Separate keyholder apparatus and same combined with wallet. 4,796,750, Cl. 206-37.400.
Injecto Mold: *See—*
Bory, Steven, 4,796,329, Cl. 16-121.000.
Inland Steel Company: *See—*
Wilson, Roland B.; Shapiro, Jack M.; and Cline, Richard S., 4,796,946, Cl. 296-146.000.
Inokuchi, Haruhisa; and Sakai, Takami, to Kabushiki Kaisha Toshiba. Power converter. 4,797,799, Cl. 363-37.000.
Inomata, Tatsuaki: *See—*
Kimura, Masatoshi; Okuda, Hiroshi; Fujikawa, Yujiro; and Inomata, Tatsuaki, 4,796,411, Cl. 53-453.000.
Inoue, Bert; and Lee, Phil, to Dura Lee, Ltd. Collapsible reusable planter box. 4,796,383, Cl. 47-73.000.
Inoue Japax Research Incorporated: *See—*
Kiyoshi, Inoue, 4,797,526, Cl. 219-69.00W.
Inoue, Kenichi: *See—*
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,797,321, Cl. 428-328.000.
Inoue, Masami: *See—*
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Inoue, Saburo: *See—*
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Inoue, Shoji: *See—*
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Inoue, Tadashi; Ohkoba, Akira; Sakashita, Kunio; Utsunomiya, Akira; Shinozaki, Takeki; and Ieda, Minoru, to Mitsui Toatsu Chemicals, Inc. Process for the production of highly concentrated phosphoric acid. 4,797,265, Cl. 423-320.000.
Inoue, Yasuhiko; Matsuda, Masaaki; and Akiyoshi, Yoshirou, to Sumitomo Chemical Company, Limited. Recovery of metals adsorbed on chelating agents. 4,797,264, Cl. 423-7.000.
Inoue, Yoshinori: *See—*
Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, 4,796,439, Cl. 62-159.000.
Instant Security Systems, Inc.: *See—*
Vorzimmer, Mark A.; and Beardslee, John, 4,797,657, Cl. 340-541.000.
Institut Francais du Petrole: *See—*
Degobert, Paul; Goldenberg, Emmanuel; Nadaud, Yvon; and Molinier, Michel, 4,796,590, Cl. 123-489.000.
Institut Francais du Petrole & Compagnie Generale De Geophysique: *See—*
Laurent, Jean; Naville, Charles; and Paterna, Rene, 4,796,723, Cl. 181-102.000.
Intel Corporation: *See—*
Lee, Winston K. M.; Oto, Duane H.; and Tam, Simon M., 4,797,856, Cl. 365-185.000.
Nanda, Sunil, 4,797,852, Cl. 364-900.000.
International Business Machines Corporation: *See—*
Brenza, James G., 4,797,814, Cl. 364-200.000.
Bui, Vu Q.; Chan, Kevin K.; Hoffarth, Joseph G.; and Malueg, Vicki J., 4,797,178, Cl. 156-643.000.
Nackman, Lee R.; and Srinivasan, Vijay, 4,797,842, Cl. 364-578.000.
Rockett, Leonard R., Jr., 4,797,804, Cl. 365-154.000.
Smith, Ted M., 4,796,357, Cl. 29-840.000.
Will, Terry A., 4,797,938, Cl. 382-7.000.
International Computers Limited: *See—*
Duxbury, Colin M.; and Yates, Raymond, 4,797,951, Cl. 455-608.000.
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Mintz, Michael, 4,797,369, Cl. 436-69.000.
Inui, Keiichiro: *See—*
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Inventions, Inc.: *See—*
Szlam, Aleksander; Crooks, James W., Jr.; and Marks, Curtis G., 4,797,911, Cl. 379-67.000.
Irvin Industries, Inc.: *See—*
Lobanoff, Mark; and Gavagan, James A., 4,796,944, Cl. 296-97.500.
Ishibashi, Koichiro; Minato, Osamu; Masuhara, Toshiaki; Sakai, Yoshio; Yamanaka, Toshiaki; Hashimoto, Naotaka; Hanamura, Shoji; Moriwaki, Nobuyuki; Honjyo, Shigeru; and Ueda, Kiyotsugu, to Hitachi, Ltd. Semiconductor memory device. 4,797,717, Cl. 357-23.100.
Ishida, Masako: *See—*
Saito, Masato; Fukuyama, Keiji; Ishida, Masako; Watanabe, Keiji; Kamata, Toyokazu; and Sano, Kinjiro, 4,797,593, Cl. 313-346.00R.
Ishida, Noboru: *See—*
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Ishiguro, Masanori: *See—*
Akao, Mutsuo; Endo, Hisao; Sata, Toshio; and Ishiguro, Masanori, 4,796,823, Cl. 242-71.800.
Ishikawa, Hiromi, to Fuji Photo Film Co., Ltd. Optical scanning device. 4,796,965, Cl. 350-6.800.
Ishikawa, Masao; Koboshi, Shigeharu; Miyaoka, Kazuyoshi; and Kuse, Satoru, to Konishiroku Photo Industry Co., Ltd. Method for processing silver halide color photographic materials. 4,797,351, Cl. 430-387.000.
Ishikawa, Minoru, to Fuji Photo Film Co., Ltd. Heat developing device. 4,797,710, Cl. 355-27.000.
Ishikawajima-Harima Heavy Industries Co., Ltd.: *See—*
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.
Ishimoto, Shoji, to NEC Corporation. Output circuit with improved timing control circuit. 4,797,573, Cl. 307-269.000.
Ishiyama, Fumio: *See—*
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Ishizuka, Ichiro: *See—*
Sumimoto, Shinzaburo; Ishizuka, Ichiro; Kai, Hiroyuki; Ueda, Shiro; and Takase, Akira, 4,797,492, Cl. 548-245.000.
Isohata, Shigeru; and Tsukakoshi, Masao, to AMP Incorporated. Electrical connector having a movable contact guide and lance-maintaining member. 4,797,116, Cl. 439-141.000.
Israel, Benjamin, to Jardin, Inc. Solarium with muntinless exterior. 4,796,395, Cl. 52-86.000.
Istac, Incorporated: *See—*
MacDoran, Peter F.; and Spitzmesser, Donovan J., 4,797,677, Cl. 342-352.000.
Ito, Hiromasa: *See—*
Inaba, Fumio; Ito, Hiromasa; Onodera, Noriaki; and Mizuyoshi, Akira, 4,797,890, Cl. 372-46.000.
Ito, Hiromichi: *See—*
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Ito, Hiroshi: *See—*
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Ito, Keizo: *See—*
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Ito, Ken: *See*—
Kuroki, Junsuke; Takahashi, Tohru; and Ito, Ken, 4,796,911, Cl. 280-689.000.
Ito, Kenzi: *See*—
Nakanishi, Nobuyasu; Noguchi, Noboru; Aizawa, Hideyuki; and Ito, Kenzi, 4,797,612, Cl. 324-173.000.
Ito, Masao: *See*—
Yamada, Kunio; and Ito, Masao, 4,796,961, Cl. 350-6.800.
Ito, Masayoshi: *See*—
Yoshimura, Shoji; Tani, Yoichiro; Matsuzaki, Youzi; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,797,477, Cl. 536-18.500.
Ito, Tadao: *See*—
Yamamoto, Kiyoshi; Nakamura, Toshihiro; Ito, Tadao; and Inui, Keiichiro, 4,797,230, Cl. 252-364.000.
Ito, Toshio; Miwa, Takashi; and Yamagishi, Fujio, to G-C Toshi Kogyo Corporation. Measuring tool for the selection of artificial teeth. 4,797,096, Cl. 433-26.000.
Itoh, Hideaki, to Fujitsu Limited. Channel switching system without instantaneous signal loss. 4,797,903, Cl. 375-40.000.
Itoh, Mitsuru. Garment. 4,796,305, Cl. 2-97.000.
Itoh, Taichi: *See*—
Takita, Masaaki; Tsuru, Yoshikazu; Ushihara, Masaharu; Itoh, Taichi; and Tanaka, Masumi, 4,797,690, Cl. 346-105.000.
ITT Corporation: *See*—
Feamster, Kim L., 4,797,118, Cl. 439-264.000.
Itzel, Hanshelmut: *See*—
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Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and by Belkin, Naum S., administrator. Carbamic acid derivatives and method for preparing same. 4,797,494, Cl. 548-374.000.
Iwahashi, Haruo; and Nakazawa, Kazuhiro, to Konica Corporation. Image forming apparatus. 4,797,707, Cl. 355-14.00R.
Iwamatsu, Noboru: *See*—
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,796,352, Cl. 29-596.000.
Iwase, Nobuo, to Kabushiki Kaisha Toshiba. Ceramic circuit substrates and methods of manufacturing same. 4,797,530, Cl. 219-121.850.
Iwata, Takeshi: *See*—
Fujii, Noriaki; Iwata, Takeshi; and Oikawa, Toshihiro, 4,796,574, Cl. 123-90.230.
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J. E. Morgan Knitting Mills, Inc.: *See*—
Kemp, Philip, 4,797,311, Cl. 428-92.000.
J. M. Voith GmbH: *See*—
Schiel, Christian, 4,796,452, Cl. 72-245.000.
Schiel, Christian; and Bauder, Albrecht, 4,796,525, Cl. 100-93.0RP.
Jabco Manufacturing, Inc.: *See*—
Bryant, James A., 4,797,420, Cl. 514-643.000.
Jack, Richard A.: *See*—
Hinman, Edmund R.; and Jack, Richard A., 4,797,189, Cl. 204-224.00M.
Jackson, David M.: *See*—
Brooker, Ronald W.; Cohen, Bernard; and Jackson, David M., 4,797,318, Cl. 428-283.000.
Jackson, Derek H. A., to Amicon Wright Ltd. Adjustable distribution cell apparatus. 4,797,209, Cl. 210-656.000.
Jackson, Michael C., to General Electric Company, p.l.c., The. Digital mixing apparatus which attenuates the sum frequency of the mixed signals. 4,797,844, Cl. 364-724.010.
Jacob, Friedrich: *See*—
Gundlach, Hans-Werner; and Jacob, Friedrich, 4,796,688, Cl. 164-457.000.
JacTac, Inc.: *See*—
Hoopengardner, Merle R., 4,797,170, Cl. 156-71.000.
Jagenberg Aktienbesellschaft: *See*—
Martini, Norbert; and Naudascher, Peter, 4,796,879, Cl. 271-218.000.
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Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.
Jahn, Helmut; and Karger, Waldemar, to Hoechst Aktiengesellschaft. Measuring device for the measurement of the deformability of red blood corpuscles. 4,797,606, Cl. 324-71.100.
Jahn, Robert E.: *See*—
Owen, Dave L.; and Jahn, Robert E., 4,796,405, Cl. 53-222.000.
Jahoda, Peter: *See*—
Oliver, Dell B.; and Jahoda, Peter, 4,797,317, Cl. 428-204.000.
James, Larry S. Multifluid heat pump system. 4,796,437, Cl. 62-79.000.
James River II, Inc.: *See*—
Schutz, Rudolph W.; and Schultz, William, 4,796,832, Cl. 242-55.300.
Jameson, Ian: *See*—
Aubrey, David R.; and Jameson, Ian, 4,797,775, Cl. 361-93.000.
Jamieson, Robert E. Beaver control siphon apparatus. 4,797,028, Cl. 405-108.000.
Jandacek, Ronald J.; and Letton, James C., to Proctor & Gamble Company, The. Compositions containing novel solid, nondigestible, fat-like compounds. 4,797,300, Cl. 426-549.000.
Jardin, Inc.: *See*—
Israel, Benjamin, 4,796,395, Cl. 52-86.000.
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El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.
Jeffries, Alfred T., III, to Olin Hunt Specialty Products, Inc. Light-sensitive 1,2-naphthoquinone-2-diazide-4-sulfonic acid monoesters of cycloalkyl substituted phenol and their use in light-sensitive mixtures. 4,797,345, Cl. 430-165.000.
Jehanno, Nicole: *See*—
Junino, Alex; Lang, Gerard; Jehanno, Nicole; and Vandenbosche, Jean J., 4,797,129, Cl. 8-407.000.
Jensen, Leif M., to Rockwool International A/S. Method of preparing a melt for the production of mineral wool. 4,797,142, Cl. 65-2.000.
Jerr-Dan Corportion: *See*—
Shoup, Gary L.; Coffman, Allen B.; and Fix, Robert L., 4,797,057, Cl. 414-563.000.
Jidosha Kiki Co., Ltd.: *See*—
Ebina, Akimitsu, 4,796,485, Cl. 74-866.000.
Jiumr, Fanchan J. Physical training apparatus. 4,796,882, Cl. 272-72.000.
Job, Eduard J. Glass bulb for sprinkler heads. 4,796,710, Cl. 169-38.000.
John Hopkins University: *See*—
Karweit, Michael J., 4,797,750, Cl. 358-335.000.
Johnson, David A.: *See*—
Zweifel, Terry L.; and Johnson, David A., 4,797,674, Cl. 340-968.000.
Johnson, David W., Jr.: *See*—
Gyorgy, Ernst M.; Hellman, Frances; and Johnson, David W., Jr., 4,797,386, Cl. 505-1.000.
Johnson, E. A.: *See*—
Tworoger, Peter C.; and Johnson, E. A., 4,797,055, Cl. 414-283.000.
Johnson, James N. Micro-abrasive finishing device. 4,796,387, Cl. 51-62.000.
Johnson & Johnson Orthopaedics, Inc.: *See*—
Kammerer, Gene W.; and Barcan, Donald, 4,797,309, Cl. 428-35.300.
Jolson, Joseph D.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,797,180, Cl. 204-1.00T.
Jones, Charles E.: *See*—
Amick, David R.; Jones, Charles E.; and Hughes, Kathleen A., 4,797,223, Cl. 252-174.230.
Jones, David F.: *See*—
Bowker, Duane O.; Giuliani, Adrian A.; and Jones, David F., 4,797,915, Cl. 379-216.000.
Jones, Frank L.: *See*—
Austin, Richard L.; Otto, Herbert J.; and Jones, Frank L., 4,797,619, Cl. 324-409.000.
Jones, Joel F.: *See*—
Edwards, Wallace L.; Jones, Joel F.; and Thompson, Howard G., Jr., 4,797,075, Cl. 418-48.000.
Jones, Joseph S.: *See*—
Swann, Peter R.; and Jones, Joseph S., 4,797,261, Cl. 422-102.000.
Jones, Paul C.: *See*—
Nichelson, William; Groff, Gordon H.; and Jones, Paul C., 4,796,878, Cl. 271-10.000.
Jones, Robert L. Retractable arrow launch ramp with compound crossbow. 4,796,598, Cl. 124-25.000.
Jonner, Wolf-Dieter; and Zechmann, Jurgen, to Robert Bosch GmbH. Clutch actuation device. 4,796,739, Cl. 192-13.00R.
Jorgensen, Jorgen A.: *See*—
Dalquist, H. David; Jorgensen, Jorgen A.; Keleny, Lloyd G.; Nygren, Donald W.; and Taylor, John N., 4,796,776, Cl. 220-203.000.
Jorgensen, Paul R., to Durgo AG. Circuit arrangement and resonant label, and a process for its production. 4,797,785, Cl. 361-402.000.
Jorgenson, Michael W.: *See*—
Myerly, Richard C.; Jorgenson, Michael W.; and Critchfield, Frank E., 4,797,501, Cl. 556-445.000.
Joyner Engineers & Trainers, Inc.: *See*—
Joyner, Luther L., 4,797,670, Cl. 340-825.170.
Joyner, Luther L., to Joyner Engineers & Trainers, Inc. Redundant signal selector system. 4,797,670, Cl. 340-825.170.
Juki Corporation: *See*—
Nukushina, Masanori, 4,796,551, Cl. 112-266.100.
Junash, Viktor M.: *See*—
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June, George: *See*—
Pierce, William W.; June, George; Meadows, James M.; and Cheek, Albert G., 4,797,291, Cl. 426-63.000.
Junino, Alex; Lang, Gerard; Jehanno, Nicole; and Vandenbosche, Jean J., to L'Oreal. Dye compositions for keratinous fibres containing 2-nitro-metaphenylenediamines. 4,797,129, Cl. 8-407.000.
Kabel, Terry D., to Halliburton Company. Dual seal valve. 4,796,858, Cl. 251-171.000.
Kabelitz, Hans-Peter: *See*—
Deters, Ludger; Englander, Heinrich; Kabelitz, Hans-Peter; and Schutz, Gunter, 4,797,062, Cl. 415-90.000.

kabelmetal electro Gesellschaft mit beschrankter Haftung: *See*—
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Gustavsson, Stig I.; and Arielly, Salo, 4,797,472, Cl. 530-331.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
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Kabushiki Kaisha Tohken: *See*—
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Kabushiki Kaisha Toshiba: *See*—
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Ando, Hideo, 4,797,868, Cl. 369-44.000.
Baldwin, David R.; and Sata, Shingo, 4,797,755, Cl. 360-49.000.
Furuhashi, Takeshi; and Kamei, Yoshio, 4,797,801, Cl. 363-43.000.
Igarashi, Tetsu, 4,797,813, Cl. 364-200.000.
Inokuchi, Haruhisa; and Sakai, Takami, 4,797,799, Cl. 363-37.000.
Iwase, Nobuo, 4,797,530, Cl. 219-121.850.
Kihara, Jyunichi, 4,797,812, Cl. 364-200.000.
Kuroda, Fumihiko, 4,797,371, Cl. 437-2.000.
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Okouchi, Satoshi, 4,797,017, Cl. 400-59.000.
Okubo, Yasuo; and Hirasawa, Masataka, 4,797,574, Cl. 307-269.000.
Sugiyama, Fumio; and Dachiku, Kenshi, 4,797,742, Cl. 358-141.000.
Takiguchi, Toshio, 4,797,192, Cl. 204-412.000.
Tanaka, Shigeru; and Ishiyama, Fumio, 4,797,908, Cl. 378-105.000.
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Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
Kawai, Yasuo; Yazawa, Kazunaga; Suegara, Nobuo; and Shimohashi, Hirotaka, 4,797,278, Cl. 424-93.000.
Sasaki, Minoru, 4,796,638, Cl. 128-696.000.
Kabushikigaisha Tokyo Kikai Seisakusho: *See*—
Okamura, Yuuichi, 4,796,549, Cl. 101-350.000.
Kadokura, Hidekimi; Sawara, Kenichi; and Yako, Tadaaki, to Sumitomo Chemical Company, Ltd. Purification of organometallic compounds. 4,797,500, Cl. 556-1.000.
Kadota, Koji: *See*—
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.
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Kajimura, Takashi: *See*—
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Kajiwara, Tokuji, 4,796,747, Cl. 198-535.000.
Kajiwara, Tokuji, to Kajiwara Kogyo Kabushiki Kaisha. Foodstuff delivery machine. 4,796,747, Cl. 198-535.000.
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Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
Kali und Salz Aktiengesellschaft: *See*—
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Kallman, Robert; and Henderson, Mark. Dust ruffles for a bed. 4,796,317, Cl. 5-493.000.
Kalman, Jeffrey M.: *See*—
Spirk, John W.; Nottingham, John R.; and Kalman, Jeffrey M., 4,796,784, Cl. 222-80.000.
Kamada, Hiroshi: *See*—
Katsuta, Yuji; Kita, Sumio; Takano, Sakuharu; and Kamada, Hiroshi, 4,797,946, Cl. 382-61.000.
Kamata, Toyokazu: *See*—
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Kamei, Kiyohiro: *See*—
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Kammerer, Gene W.; and Barcan, Donald, to Johnson & Johnson Orthopaedics, Inc. Foil pouch. 4,797,309, Cl. 428-35.300.
Kanai, Hiroshi: *See*—
Ezaki, Joichiro; and Kanai, Hiroshi, 4,797,765, Cl. 360-110.000.
Kanai, Takao: *See*—
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Kanai, Yutaka: *See*—
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Kanao, Shiro. Pressure-withstanding pipe. 4,796,672, Cl. 138-154.000.
Kanbe, Junichiro: *See*—
Kaneko, Shuzo; Toyono, Tsutomu; and Kanbe, Junichiro, 4,796,980, Cl. 350-350.00S.
Kane, Thomas J., to Light Wave Electronics Co. Solid state optical ring resonator and laser using same. 4,797,896, Cl. 372-94.000.
Kanebo, Ltd.: *See*—
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, 4,797,400, Cl. 514-255.000.
Kaneda, Setsuo: *See*—
Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, 4,796,439, Cl. 62-159.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,797,527, Cl. 219-69.00E.
Kaneko, Shinichi: *See*—
Sugano, Mitugu; Kaneko, Shinichi; Oka, Mitsunori; Nokina, Kimiya; and Koshimizu, Kazuhiro, 4,797,754, Cl. 360-48.000.
Kaneko, Shuzo; Toyono, Tsutomu; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal optical modulation device with regions within pixels to initiate nucleation and inversion. 4,796,980, Cl. 350-350.00S.
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Kanengieter, Glenn G.; and Stomberg, David E., to Austoft Inc. (U.S.A.). Brake noise reduction system. 4,796,728, Cl. 188-18.00A.
Kanthal AB: *See*—
Berthelius, Rolf; and Fredriksson, Tommy, 4,797,537, Cl. 219-528.000.
Kao Corporation: *See*—
Yamamoto, Yuzo; Nagamori, Hiroyuki; and Kitazawa, Kozo, 4,797,183, Cl. 204-16.000.
Kaplan, Murray; and Humes, Robert W., to Science Dynamics Corporation. Direct telephone dial ordering service. 4,797,913, Cl. 379-91.000.
Kaplan, Sidney; and Wong, Mon N., to Hughes Aircraft Company. Dual-mode circular-polarization horn. 4,797,681, Cl. 343-786.000.
Kaplanis, Kostas, to Patton Electric Company, Inc. Immersion detector circuit interrupter. 4,797,772, Cl. 361-42.000.
Karaev, Islam K. O.: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
Karamata, Dimitri; and Piot, Jean-Christophe, to Sandoz Ltd. Insecticidal hybrid bacteria from *b.t. kurstaki* and *b.t. tenebrionis*. 4,797,279, Cl. 424-93.000.
Karg, Rodrick D.; and Whetstone, Thomas N., to General Motors Corporation. Seat handling fixture. 4,797,059, Cl. 414-590.000.
Karger, Waldemar: *See*—
Jahn, Helmut; and Karger, Waldemar, 4,797,606, Cl. 324-71.100.
Karl Lautenschlager GmbH & Co. KG: *See*—
Lautenschlager, Karl, Jr.; and Lautenschlager, Gerhard, 4,797,045, Cl. 411-107.000.
Kartzow, Manfred: *See*—
Schuster, Erich; and Kartzow, Manfred, 4,796,999, Cl. 356-394.000.
Karweit, Michael J., to John Hopkins University. Method and apparatus for transmitting/recording computer-generated displays on an information channel having only audio bandwidth. 4,797,750, Cl. 358-335.000.
Karwoski, Thaddeus M. Orthodontic wire terminal and attachment tool therefor. 4,797,094, Cl. 433-22.000.
Kasajima, Hirokazu: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.
Kashi, Motofumi; and Shimoe, Hiroaki, to Kabushiki Kaisha Tohken. Color recognition apparatus. 4,797,738, Cl. 358-101.000.
Kashima, Yutaka: *See*—
Hagimoto, Hakumi; Kashima, Yutaka; Kondo, Norio; and Inoue, Masami, 4,797,031, Cl. 405-133.000.
Kashio, Hideyuki: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.
Kasiske, W. Charles, Jr.; and Fiske, John M., to Eastman Kodak Company. Apparatus for scavenging unwanted particles from a photoconductor of an electrographic apparatus. 4,797,708, Cl. 355-15.000.
Kastner, Hans-Werner; Klockler, Robert; and Hage, Manfred, to Weiland-Werke AG. Finned tube with indented groove base and method of forming same. 4,796,693, Cl. 165-133.000.
Kastner, Klaus: *See*—
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Katayama, Aiichi: *See*—
Nakatsugawa, Kenji; Katayama, Aiichi; Sekiya, Hitoshi; and Hiratsuka, Shoji, 4,797,936, Cl. 382-1.000.
Katayama, Susumu, to Matsushita Electric Works, Ltd. Electrostatic transducer. 4,796,725, Cl. 181-142.000.
Katayama, Yoshio: *See*—
Koizumi, Satoru; Teshima, Daisuke; and Katayama, Yoshio, 4,797,759, Cl. 360-92.000.

Katchko, John E.; Strobel, Charles W.; and Plaisance, Thomas H., to DeSoto, Inc. Thermosetting size press composition. 4,797,176, Cl. 162-135.000.

Kato, Nobukatsu: *See*—
Fukuda, Yoshiaki; Miyasaka, Takeshi; Matsumoto, Iori; Kato, Nobukatsu; and Ema, Kenji, 4,797,242, Cl. 264-108.000.

Katsuta, Yuji; Kita, Sumio; Takano, Sakuharu; and Kamada, Hiroshi, to Sharp Kabushiki Kaisha. Information record/retrieval device. 4,797,946, Cl. 382-61.000.

Kau, Jee I.: *See*—
Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,797,187, Cl. 204-180.200.

Kaurich, Michael S.; and Rishel, Paul E., to General Motors Corporation. Seat belt extender. 4,796,915, Cl. 280-802.000.

Kauth, Hans-Herbert; and Itzel, Hanshelmut, to Celamerck GmbH & Co. KG. Insecticidal compositions. 4,796,381, Cl. 43-124.000.

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Aguillen, Domingo V., Jr.; Casares, Pete P.; DeForrest, John E.; Green, Kevin C.; Kavanagh, Rocque A.; Wilkinson, Bryan; Marks, Marc K.; and Zuniga, Gerardo, 4,796,347, Cl. 29-280.000.

Kavehrad, Mohsen: *See*—
Habbab, Isam M. I.; Kavehrad, Mohsen; and Sundberg, Carl-Erik, 4,797,879, Cl. 370-3.000.

Kawabata, Misao; and Kobayashi, Tetsuro, to Bridgestone Corporation. Pneumatic radial tire. 4,796,683, Cl. 152-209.00R.

Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, to Fanuc Ltd. AC servomotor and a method of manufacturing the same. 4,796,352, Cl. 29-596.000.

Kawai, Yasuo; Yazawa, Kazunaga; Suegara, Nobuo; and Shimohashi, Hirotaka, to Kabushiki Kaisya Advance Kaihatsu Kenkyujo. Hypocholesterolemically and/or hypotriglyceridemically active products and their use. 4,797,278, Cl. 424-93.000.

Kawamura, Mitsuyoshi: *See*—
Akao, Shigeaki; Kawamura, Mitsuyoshi; and Kojima, Takio, 4,796,517, Cl. 92-187.000.
Matsuura, Tooru; Ishida, Noboru; and Kawamura, Mitsuyoshi, 4,796,576, Cl. 123-90.430.

Kawano, Katsumi: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.

Kawasaki, Hiroshi: *See*—
Yamada, umito; Kawasaki, Hiroshi; and Satake, Masaki, 4,797,353, Cl. 430-434.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.

Kawasaki, Yoshinobu; Niikawa, Ryo; and Ikeda, Yuzi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle body positioning apparatus. 4,796,346, Cl. 29-700.000.

Kawashima, Hideaki: *See*—
Matsuno, Kazuhiro, deceased; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,797,493, Cl. 548-312.000.

Kawashima, Masahiro, to Olympus Optical Co., Ltd. Endoscope and a light guide thereof anó a method for manufacturing the light guide. 4,796,604, Cl. 128-6.000.

Kawashima, Saburo: *See*—
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.

Kawashima, Takuji: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.

Kawata, Shosaku, to Nakanishi Dental Mfg. Co., Ltd. Apparatus for dental treatment provided with check valve in fluid passage. 4,797,098, Cl. 433-98.000.

Kay, Ian T.: *See*—
Turnbull, Michael D.; and Kay, Ian T., 4,797,398, Cl. 514-237.500.

Kaya, Toshio; and Fujimoto, Makoto, to Mitsui Petrochemical Industries, Ltd. Method of cutting an organic membrane. 4,797,177, Cl. 156-630.000.

Kayanuma, Nobuaki: *See*—
Nagai, Toshinari; and Kayanuma, Nobuaki, 4,796,425, Cl. 60-274.000.

Kayner, Morris. Desktop organizer. 4,796,847, Cl. 248-441.100.

Kees, George, Jr., to Codman & Shurtleff, Inc. Aneurysm clip. 4,796,625, Cl. 128-325.000.

Kegasa, Koyo; Murai, Takafumi; Yamanaka, Osamu; and Fujii, Takeshi, to Mitsubishi Denki Kabushiki Daisha. PLL frequency synthesizer. 4,797,637, Cl. 331-4.000.

Kehl, Georg; and Schafer, Ernst-Dieter, to Robert Bosch GmbH. Brake pressure control valve. 4,796,667, Cl. 137-629.000.

Keleny, Lloyd G.: *See*—
Dalquist, H. David; Jorgensen, Jorgen A.; Keleny, Lloyd G.; Nygren, Donald W.; and Taylor, John N., 4,796,776, Cl. 220-203.000.

Keller, Russell D. Vented fuel tank cap and valve assembly. 4,796,777, Cl. 220-203.000.

Keller, Stephen A.: *See*—
Verret, Douglas P.; Smayling, Michael C.; Sachdeva, Abnash C.; and Keller, Stephen A., 4,797,372, Cl. 437-034.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Induction heater for floating zone melting. 4,797,525, Cl. 219-10.790.

Kelley, Winfield L. Air volume regulator valve. 4,796,803, Cl. 236-49.000.

Kelm, James S.: *See*—
Lievestro, Louis; Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; and Wakeman, Thomas G., 4,796,423, Cl. 60-39.330.

Kemp, John E. G.; and Cross, Peter E., to Pfizer Inc. 4-Substituted-1-(4-alkylsulphonamidophenyl)piperazines as antiarrhythmic agents. 4,797,401, Cl. 514-255.000.

Kemp, Philip, to J. E. Morgan Knitting Mills, Inc. Insulating fabric and method of manufacture thereof. 4,797,311, Cl. 428-92.000.

Kendall Company, The: *See*—
Huddleston, Elwyn; and Long, Karen C., 4,797,322, Cl. 428-355.000.

Kennedy, Ralph; and Grau, John L., to Ampsco Corporation. Device for cutting a receptacle in pavement to receive a reflector. 4,797,025, Cl. 404-90.000.

Kenyon, Rebecca A.: *See*—
Brooks, Norman D.; Kenyon, Rebecca A.; and Vanevenhoven, Peter W., 4,797,275, Cl. 424-78.000.

Keppler, Charles N. Appliance paging system. 4,797,656, Cl. 340-539.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Ehrfeld, Wolfgang; and Munchmeyer, Dietrich, 4,797,211, Cl. 210-321.840.

Kesel, Thomas A.; and Paszko, Robert M., to Ford Motor Company. Release linkage for door latch. 4,796,934, Cl. 292-336.300.

Kesaler, David: *See*—
DeJager, Donald; and Kessler, David, 4,796,962, Cl. 350-6.800.

Kesaler, Milton: *See*—
Kessler, Ronald N.; Ullman, Myron; and Kessler, Milton, 4,796,399, Cl. 52-177.000.

Kessler, Ronald N.; Ullman, Myron; and Kessler, Milton, to Boardman Molded Products, Inc. Combination walk-off and fatigue mat. 4,796,399, Cl. 52-177.000.

Keur, Michael R.: *See*—
Lukas, Gregory J.; Sweeney, Kevin L.; and Keur, Michael R., 4,796,975, Cl. 350-320.000.

Keuter, Dale H., to Eastern Iowa Pork. Wire mesh flooring. 4,796,563, Cl. 119-28.000.

Keys, John B.: *See*—
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Kezerian, Charles: *See*—
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Kharkovsky Aviatsionny Institut: *See*—
Bozhko, Valery P.; Yatsenko, Sergei V.; Strizhenko, Vitaly E.; Losev, Alexei V.; Pleshkov, Viktor I.; and Junash, Viktor M., 4,796,867, Cl. 266-51.000.
Bozhko, Valery P.; Losev, Alexei V.; Strizhenko, Vitaly; Pleshkov, Viktor I.; and Levityansky, Ivan A., 4,796,868, Cl. 266-51.000.

Khinchuk, Gregory. Impinging-jet fuel injection nozzle. 4,796,816, Cl. 239-501.000.

Kidani, Yoshinori; and Noji, Masahide, to Yoshinori Kidani. Platinum-flavin anti-tumor complexes. 4,797,485, Cl. 544-225.000.

Kihara, Jyunichi, to Kabushiki Kaisha Toshiba. System for continuous DMA transfer of virtually addressed data blocks. 4,797,812, Cl. 364-200.000.

Kikkoman Corporation: *See*—
Ariga, Toshiaki; Koshiyama, Ikunori; and Fukushima, Danji, 4,797,421, Cl. 514-844.000.
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, 4,797,358, Cl. 435-176.000.

Kikuchi, Katsuaki: *See*—
Nakamura, Tomio; Kikuchi, Katsuaki; and Inagaki, Takeshi, 4,797,184, Cl. 204-59.00R.

Kiibane, Farrell M.; and Dunbar, F. Curtiss, to Armco Inc. Oxidation resistant ferrous base foil. 4,797,329, Cl. 428-623.000.

Kilmer, Dan L.: *See*—
Levy, Lloyd; Kilmer, Dan L.; and Maher, Kevin P., 4,797,762, Cl. 360-99.060.
Levy, Lloyd; Warner, Michael W.; and Kilmer, Dan L., 4,797,763, Cl. 360-104.000.

Kim, Sang H. Vacuum advance regulator for a spark ignition engine. 4,796,585, Cl. 123-409.000.

Kimberly-Clark Corporation: *See*—
Brooker, Ronald W.; Cohen, Bernard; and Jackson, David M., 4,797,318, Cl. 428-283.000.
Van Gompel, Paul T., 4,797,171, Cl. 156-322.000.

Kimizu, Ryuichi, to Omron Tateisi Electronics Co. Payment making terminal device. 4,797,540, Cl. 235-383.000.

Kimura, Masatoshi; Okuda, Hiroshi; Fujikawa, Yujiro; and Inomata, Tatsuaki, to Prima Meat Packers, Ltd. Research and Development Center. Packaging food in raised state. 4,796,411, Cl. 53-453.000.

Kimura, Takaaki: *See*—
Tanaka, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; Murofushi, Toshiaki; and Kimura, Takaaki, 4,797,340, Cl. 430-109.000.

Kimura, Tatsuo, to Nittan Company, Limited. Environmental abnormality detection apparatus. 4,797,664, Cl. 340-693.000.

King, Francis D., to Beecham Group, p.l.c. Certain pharmaceutically useful ureas. 4,797,387, Cl. 514-212.000.

King, Kenneth R.: *See*—
Symonds, Darrell; King, Kenneth R.; and Smith, William N., 4,796,939, Cl. 294-67.100.

Kinoshita, Masayoshi: *See*—
Kobayashi, Yoshio; Tojo, Chiaki; and Kinoshita, Masayoshi, 4,796,547, Cl. 110-263.000.
Kippenberg, Horst: *See*—
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Kirby, David W.: *See*—
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Kircher, Klaus: *See*—
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El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.
Kirchmayr, Karl; Miko, Hans-Jurgen; Watzka, Bruno; Studinka, Josef; and Schmitt-Henco, Carl, to Ametex AG. Mixture for manufacture of shaped elements and its use. 4,797,161, Cl. 106-98.000.
Kirkendall, Vern S. Low-bed service cart. 4,796,909, Cl. 280-651.000.
Kirschenstein, Reinhard: *See*—
Klemmer, Wolfram; and Kirschenstein, Reinhard, 4,797,744, Cl. 358-164.000.
Kishi, Mitsuhiro; and Nagasawa, Yokichi. Earth-working machine. 4,797,060, Cl. 414-687.000.
Kishima, Noboru; and Matsumoto, Akio, to Toto Ltd. Method of producing porous material having open pores. 4,797,425, Cl. 521-64.000.
Kita, Sumio: *See*—
Katsuta, Yuji; Kita, Sumio; Takano, Sakuharu; and Kamada, Hiroshi, 4,797,946, Cl. 382-61.000.
Kitabatake, Makoto; Setsune, Kentaro; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Optical valve. 4,796,982, Cl. 350-356.000.
Kitagawa, Satoshi: *See*—
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Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Apparatus for separating oily cutting liquid. 4,797,205, Cl. 210-86.000.
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Kiyokawa, Morio; and Fujimoto, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Dual language numerical controller. 4,797,811, Cl. 364-200.000.
Kiyono, Masashi; Abe, Tomoaki; and Takao, Mitsunori, to Nippondenso Co., Ltd. Internal combustion engine control system. 4,796,591, Cl. 123-492.000.
Kiyoshi, Inoue, to Inoue Japax Research Incorporated. Method for wire-cut electric discharge machining utilizing adjoining segments of a common electrode. 4,797,526, Cl. 219-69.00W.
Klaussner, Hans-Jurgen. Apparatus for stripping electrical conductors. 4,796,491, Cl. 81-9.510.
Kleijn, Willem B.: *See*—
Bronson, Edward C.; Hartwell, Walter T.; Kleijn, Willem B.; and Prezas, Dimitrios P., 4,797,926, Cl. 381-36.000.
Klein, Gerald R. Apparatus for conditioning artificial flies and leaders. 4,796,372, Cl. 43-4.000.
Klemm, Robert E.; and Lehnhardt, Gary D., to Construction Forms, Inc. Semi-liquid cementitious spray nozzle apparatus. 4,796,814, Cl. 239-430.000.
Klemmer, Wolfram; and Kirschenstein, Reinhard, to Robert Bosch GmbH. Method and circuit for nonlinear transmission-processing of a video signal. 4,797,744, Cl. 358-164.000.
Kletecka, George; Lai, John T.; and Son, Pyong-Nae, to B. F. Goodrich Company, The. Stabilized gamma-irradiated polypropylene and sterilizable articles thereof. 4,797,438, Cl. 524-100.000.
Klimczak, William N., to Hughes Aircraft Company. Deterministic thinned aperture phased antenna array. 4,797,682, Cl. 343-844.000.
Klimpel, Richard R.; and Hansen, Robert D., to Dow Chemical Company, The. Froth flotation method. 4,797,202, Cl. 209-166.000.
Kline, Loren H.: *See*—
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Klopotek, Peter, to Lambda Physik. Circuit for the preionization and main discharge of a pulsed gas laser. 4,797,888, Cl. 372-38.000.
Klosowski, Jerome M.: *See*—
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Knapp, Malcolm H.; and Sonder, Gerhard, to General Electric Company. System for displacing a power pack from a vehicle. 4,796,721, Cl. 180-294.000.
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Knights, Douglas. Garden scoop. 4,796,938, Cl. 294-55.000.
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidal substituted cyclopropyl oxime ethers. 4,797,412, Cl. 514-383.000.
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Kobbing, Heinz; and Gebhard, Hermann, to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.V. Reflection light bearer system with self-testing feature. 4,797,548, Cl. 250-221.000.
Kobinata, Motochika, to AB Tetra Pak. Strip tape for a food product packaging container. 4,796,800, Cl. 229-5.700.
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Ishikawa, Masao; Koboshi, Shigeharu; Miyaoka, Kazuyoshi; and Kuse, Satoru, 4,797,351, Cl. 430-387.000.
Koebernick, Hubert: *See*—
Lebuhn, Rolf; Feldmann, John; and Koebernick, Hubert, 4,797,478, Cl. 536-18.500.
Koehler, Georg, to Siemens Aktiengesellschaft. Shock wave generator for an apparatus for non-contacting disintegration of calculi in the body of a life form. 4,796,608, Cl. 128-24.00A.
Koelmans, Norbert, to Siemens Aktiengesellschaft. Surveillance radar system. 4,797,676, Cl. 342-176.000.
Koenig, Robert G., to Cleveland Machine Controls, Inc. Web tension transducer apparatus. 4,796,474, Cl. 73-862.650.
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Yamasaki, Norikazu; and Koga, Keiichiro, 4,797,887, Cl. 371-43.000.
Koga, Kouhei: *See*—
Nakamura, Yoshinori; Koga, Kouhei; Kosuge, Satoru; and Fukunishi, Yoshihiro, 4,797,084, Cl. 425-533.000.
Kogelnik, Hans-Joachim: *See*—
Haas, Peter; and Kogelnik, Hans-Joachim, 4,797,430, Cl. 521-164.000.
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Goto, Hiroyuki; Kohama, Tokio; Nishio, Yoshitaka; Obayashi, Hideki; and Horie, Kazuyuki, 4,796,584, Cl. 123-403.000.
Kohler Co.: *See*—
Freville, Robert; and Segor, Philip, 4,796,310, Cl. 4-199.000.
Kohmoto, Mitsuo; and Matsuo, Yohichi, to NEC Corporation. Air cooling equipment for electronic systems. 4,797,783, Cl. 361-384.000.
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Matsui, Shigeru; Onodera, Takashi; Sekihara, Kensuke; Shiono, Hidemi; and Kohno, Hideki, 4,797,616, Cl. 324-309.000.
Kohsaka, Masanobu: *See*—
Okamoto, Masanori; Uchida, Itsuo; Umehara, Kazuyoshi; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,797,417, Cl. 314-473.000.
Koide, Tetsuya: *See*—
Yoshida, Shigeo; Kitagawa, Satoshi; Harada, Shozo; Koide, Tetsuya; and Hasegawa, Manabu, 4,797,319, Cl. 428-312.400.
Koike, Atsushi: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,299, Cl. 430-65.000.
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Sasaki, Migaku; Koike, Eiji; Ohtomo, Toshio; and Hirose, Jun, 4,796,605, Cl. 600-22.000.
Koine, Richard, to Rheinmetall GmbH. Externally driven automatic weapon. 4,796,512, Cl. 89-11.000.
Koizumi, Minoru: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.
Koizumi, Satoru; Teshima, Daisuke; and Katayama, Yoshio, to Sharp Kabushiki Kaisha. Tape recorder mode selector device for plural cassette tapes. 4,797,759, Cl. 360-92.000.
Koizumi, Takashi: *See*—
Uekusa, Tadashi; Koizumi, Takashi; and Amano, Nobuhiko, 4,797,193, Cl. 204-416.000.
Kojima, Hisashi, to Technoplas, Inc. Ultrahigh speed injection molding method. 4,797,236, Cl. 264-40.100.
Kojima, Kazuo, to Uniden Corporation of America. Telephone handset cradle mounting. 4,797,916, Cl. 379-454.000.
Kojima, Takio: *See*—
Akao, Shigeaki; Kawamura, Mitsuyoshi; and Kojima, Takio, 4,796,517, Cl. 92-187.000.
Kokubo, Yoshihiro; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser apparatus. 4,797,895, Cl. 372-43.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Furukawa, Yasuo; Yamazaki, Katsuyuki; Hosaka, Takemi; and Fukui, Akira, 4,797,931, Cl. 351-56.000.
Yamasaki, Norikazu; and Koga, Keiichiro, 4,797,887, Cl. 371-43.000.
Koller, David C.: *See*—
Gruchalla, Michael E.; and Koller, David C., 4,797,628, Cl. 330-54.000.
Kollmorgen Technologies Corporation: *See*—
England, Thomas R., 4,797,592, Cl. 310-154.000.
Komanduri, Ranga, to General Electric Company. Polycrystalline diamond and CBN cutting tools. 4,797,138, Cl. 51-293.000.
Komauer, Christian: *See*—
El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.
Komine, Takashi: *See*—
Nakamura, Yoichi; Yamamoto, Shirushi; Komine, Takashi; Yokota, Akira; and Nakane, Hisashi, 4,797,348, Cl. 430-326.000.
Kondo, Hiroshi; Kusunoki, Toshimasa; and Kameda, Ryo, to Yoshida Kogyo K. K. Prefabricated window unit with air conditioning system. 4,796,519, Cl. 98-97.000.
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Shikama, Shinsuke; Kondo, Mitsushige; and Toide, Eiichi, 4,797,545, Cl. 250-201.000.
Kondo, Norio: *See*—
Hagimoto, Hakumi; Kashima, Yutaka; Kondo, Norio; and Inoue, Masami, 4,797,031, Cl. 405-133.000.
Kong, Alan, to Nifco Inc. Piston cylinder type oil damper. 4,796,732, Cl. 188-282.000.
Konica Corporation: *See*—
Iwahashi, Haruo; and Nakazawa, Kazuhiro, 4,797,707, Cl. 355-14.00R.
Konishi, Takeshi: *See*—
Fukutomi, Hisao; Tuchiya, Takanori; Yamamoto, Takeshi; Konishi, Takeshi; and Hamasaki, Iseo, 4,796,943, Cl. 296-65.100.
Konishi, Toshiharu: *See*—
Sakuramoto, Takahumi; Asoshina, Eishi; Tominaga, Takashi; Ijichi, Ichiro; Kamei, Kiyohiro; and Konishi, Toshiharu, 4,797,251, Cl. 419-9.000.
Konishiroku Photo Industries, Co., Ltd: *See*—
Brandt, Alan E.; and Uemura, Morito, 4,797,356, Cl. 435-7.000.
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Hiratsuka, Seiichiro; Haneda, Satoshi; and Shoji, Hisashi, 4,797,335, Cl. 430-35.000.
Ishikawa, Masao; Koboshi, Shigeharu; Miyaoka, Kazuyoshi; and Kuse, Satoru, 4,797,351, Cl. 430-387.000.
Koboshi, Shigeharu; and Kurematsu, Masayuki, 4,797,352, Cl. 430-421.000.
Ohbayashi, Keiji; Chino, Shigeo; Okumura, Mitsuhiro; and Onodera, Kaoru, 4,797,350, Cl. 430-380.000.
Sugita, Tunezo, 4,797,304, Cl. 427-208.600.
Yamamoto, Takeshi; Sasa, Nobumasa; and Nakano, Miegi, 4,797,346, Cl. 430-192.000.
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, to Seikosha Co., Ltd. Electrophotographic recording system. 4,797,695, Cl. 346-160.000.
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Yokoyama, Toshio; Shimane, Iwao; and Konno, Tsuneo, 4,796,354, Cl. 29-608.000.
Kono, Hisashi O.: *See*—
Fleming, Hubert L.; Edd, Jon F.; Pearson, Alan; Chou, Chin-Liang; Kono, Hisashi O.; and Huang, Ching-Chung, 4,797,271, Cl. 423-625.000.
Konrad, Eugen: *See*—
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Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; Schafer, Hermann; and Rasshofer, Werner, to Bayer Aktiengesellschaft. Composite plastic moldings and a process for their production. 4,797,320, Cl. 428-316.600.
Korbanka, Helmut: *See*—
Ertl, Josef; and Korbanka, Helmut, 4,797,436, Cl. 524-97.000.
Korinek, Richard J.: *See*—
Anderson, Arthur L.; Bailey, Douglas S.; and Korinek, Richard J., 4,797,621, Cl. 324-533.000.
Korobko, Vladlen V.: *See*—
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobko, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,796,956, Cl. 299-69.000.
Koshimizu, Kazuhiro: *See*—
Sugano, Mitugu; Kaneko, Shinichi; Oka, Mitsunori; Nokina, Kimiya; and Koshimizu, Kazuhiro, 4,797,754, Cl. 360-48.000.
Koshiyama, Ikunori: *See*—
Ariga, Toshiaki; Koshiyama, Ikunori; and Fukushima, Danji, 4,797,421, Cl. 514-844.000.
Kosowsky, Lester H.; Raber, Peter E.; and Horais, Brian J., to United Technologies Corporation. Multi-spectral radome. 4,797,683, Cl. 343-872.000.
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Nakamura, Yoshinori; Koga, Kouhei; Kosuge, Satoru; and Fukunishi, Yoshihiro, 4,797,084, Cl. 425-533.000.
Kosugi, Seiji; Ando, Norio; and Sagara, Hisao, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Coupling for multi-passage tube. 4,796,924, Cl. 285-39.000.
Kotani, Matahira; Hayashi, Motohiko; and Ooi, Yoshikatsu, to Sharp Kabushiki Kaisha. Apparatus for setting time information in facsimile system. 4,797,748, Cl. 358-257.000.
Kotobuki Seiyaku Company Limited: *See*—
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, 4,797,415, Cl. 514-469.000.
Kotynski, Robert J.: *See*—
Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., 4,796,460, Cl. 72-453.130.
Kousa, Paavo T., to Octel Communications Corp. Voice network security system. 4,797,672, Cl. 340-825.300.
Kovaleski, Joseph G.; and Arms, Thomas H. Magnetically activated fiber optic switch. 4,796,966, Cl. 350-96.200.
Kovalev, Alexei D.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Kowalski, Daniel C.: *See*—
Connell, G. A. Neville; and Kowalski, Daniel C., 4,796,964, Cl. 350-6.800.
Koyama, Hiromichi: *See*—
Miyazawa, Hideo; Andoh, Ikuhiro; Koyama, Hiromichi; and Kobayashi, Mitsuru, 4,797,119, Cl. 439-395.000.
Koyanagi, Toshio: *See*—
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Koyo Jidoki Kabushiki Kaisha: *See*—
Futaba, Takeshi; and Noguchi, Masahiko, 4,796,715, Cl. 180-143.000.
Kozilek, Joseph: *See*—
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Krahling, Franz: *See*—
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Kramer, Karl C.: *See*—
Evans, David N.; Fairchild, Charles L.; Kramer, Karl C.; Spruill, John C.; Wansor, Gerard J.; and Wood, Robert W., 4,797,293, Cl. 426-330.300.
Kramer, Vance M., Jr. System for exhausting fumes from residential garages. 4,796,520, Cl. 98-115.400.
Kranefeld, Andreas; and Temburg, Josef, to Trutzschler GmbH & Co. KG. Method and apparatus for opening fiber bales. 4,796,335, Cl. 19-80.00R.
Krapfenbauer, Hans, to Ernst Grob AG. Method of fabricating a rim gear, such as a starter rim gear made of sheet metal. 4,796,345, Cl. 29-159.200.
Krasner, Gary N.; and Berkman, John W., to Cooper Companies, Inc., The. Corneal vacuum trephine system. 4,796,623, Cl. 128-305.000.
Kraus, Uwe E., to U.S. Philips Corporation. Encoding or decoding circuit for time division multiplex and simultaneous signals. 4,797,883, Cl. 370-109.000.

Krenik, William R.: *See*—
Hsu, Wei-Chan; Krenik, William R.; and Hellums, James R., 4,797,631, Cl. 330-253.000.
Kreuch, Winfried: *See*—
Wetzel, Rolf; Coenen, Hubert; and Kreuch, Winfried, 4,797,198, Cl. 208-181.000.
Krich, David M., to GTX Corporation. High speed serial pixel neighborhood processor and method. 4,797,806, Cl. 364-900.000.
Krueger, Clyde A.; Krueger, Katharine C.; and Preus, Herman A. Slip-on weed guard for fish hooks. 4,796,378, Cl. 43-43.200.
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Krueger, Clyde A.; Krueger, Katharine C.; and Preus, Herman A., 4,796,378, Cl. 43-43.200.
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Krupp-Koppers GmbH: *See*—
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Krupp Polysius AG: *See*—
Neumann, Eberhard W., 4,797,091, Cl. 432-14.000.
Kubat, Josef; and Qvist, Lars M. Method of facilitating comminution of wood and other types of vegetable biomass for use as fuel. 4,797,135, Cl. 44-500.000.
Kubo, Kanji; and Ohno, Kenichi, to Honda Giken Kogyo Kabuchiki Kaisha. Rear wheel steering device for front and rear wheel steering system. 4,796,904, Cl. 280-91.000.
Kubo, Kazuhiko: *See*—
Usui, Akira; Kubo, Kazuhiko; and Nagai, Hiroyuki, 4,797,638, Cl. 331-117.00D.
Kubo, Michinori: *See*—
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Kuboi, Sadao; and Ohtsuki, Tomonari, to Daiichi Denshi Kogyo Kabushiki Kaisha. Drip-proof connector. 4,797,122, Cl. 439-589.000.
Kubota, Kenichi, to Tohoku Mikuni Kogyo Kabushiki Kaisha. Pump with rotating and reciprocating piston. 4,797,073, Cl. 417-461.000.
Kubota, Koichi: *See*—
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Kuchar, George J. Cylinder for combine. 4,796,645, Cl. 130-27.0HA.
Kuehl, Guenter H., to Mobil Oil Corporation. Method of producing rod-shaped ZSM-5 zeolite. 4,797,267, Cl. 423-329.000.
Kuhn, James A., II, to FMC Corporation. Plate routing method and apparatus. 4,796,341, Cl. 29-33.00P.
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Clark, Michael R.; Kuipper, Gerald J.; Monson, Donald B.; and Tringali, Dominick, 4,797,516, Cl. 200-51.00R.
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Kukes, Simon G.; Gutberlet, L. Charles; and Hensley, Albert L., Jr., to Amoco Corporation. Hydrocracking process using special juxtaposition of catalyst zones. 4,797,196, Cl. 208-59.000.
Kulagin, Rim A.: *See*—
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobko, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,796,956, Cl. 299-69.000.
Kulst, Andrew C. Adjustable, manual snowplow. 4,796,367, Cl. 37-273.000.
Kumagai, Fumio; and Okazaki, Toshio, to Yazaki Corporation. Branch wire protector. 4,797,512, Cl. 174-135.000.
Kumagai, Tadanobu, to Toyota Jidosha Kabushiki Kaisha. Drive shaft apparatus for transverse engine vehicle. 4,796,722, Cl. 180-297.000.
Kuni, Daniel R.: *See*—
Bullock, James K.; Mann, L. Arnold; and Kuni, Daniel R., 4,796,615, Cl. 128-202.270.
Kunimoto, Akihiro; Takabayashi, Seiichiro; and Matsui, Yuji, to Ube Industries, Ltd. Process for the preparation of polyimide film. 4,797,307, Cl. 427-386.000.
Kuo, Ping-Lin: *See*—
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Kupperman, Robert H.: *See*—
Salzman, Gary C.; and Kupperman, Robert H., 4,796,995, Cl. 356-368.000.
Kuppers, Helmuth; and Knauer, Hans-Jurgen, to Kali und Salz Aktiengesellschaft. Electrostatic free-fall separator. 4,797,201, Cl. 209-127.400.
Kurakake, Masahiro: *See*—
Sato, Koji; Kurakake, Masahiro; and Fujiwaki, Kazuo, 4,797,940, Cl. 382-9.000.
Kurami, Kunihiko; and Akutagawa, Kiyoshi, to Nissan Motor Company, Limited. Model follower control apparatus. 4,797,835, Cl. 364-513.000.
Kurbanov, Nariman G. O.: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
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Ueno, Masahiro; Kurita, Kozaburo; Masuda, Ikuro; and Miyakawa, Nobuaki, 4,797,583, Cl. 307-475.000.
Kuroda, Fumihiko, to Kabushiki Kaisha Toshiba. Method for forming an impurity region in semiconductor devices by out-diffusion. 4,797,371, Cl. 437-2.000.
Kuroki, Junsuke; Takahashi, Tohru; and Ito, Ken, to Nissan Motor Company, Ltd. Automotive suspension system with roll-stabilizer having road condition-dependent torsion modulus, and control of torsional modules. 4,796,911, Cl. 280-689.000.
Kuroyanagi, Hirohisa: *See*—
Mizuguchi, Masaaki; and Kuroyanagi, Hirohisa, 4,796,509, Cl. 84-454.000.
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Kuse, Satoru: *See*—
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Kondo, Hiroshi; Kusunoki, Toshimasa; and Kameda, Ryo, 4,796,519, Cl. 98-97.000.
Kutowy, Oleh: *See*—
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Kuwait Institute for Scientific Research: *See*—
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Kuzmin, Vladimir N.: *See*—
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Kwik-File, Inc.: *See*—
Nelson, Robert A.; and Altman, Carroll C., 4,796,792, Cl. 225-72.000.
Kyocera Corporation: *See*—
Tajiri, Hiromitsu; Nishiguchi, Yasuo; and Matsuyama, Chiaki, 4,797,561, Cl. 250-578.000.
Kyoto, Michihisa: *See*—
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L. Kent Eastman Co., Inc.: *See*—
Eastman, Lewis K., II; and Bromley, Robert L., 4,797,796, Cl. 362-199.000.
Labedz, Gerald P., to Motorola, Inc. Microcellular communications system using macrodiversity. 4,797,947, Cl. 455-33.000.
Lach, Lawrence E.; and Ohoka, Mikiharu, to Gould Inc.; and Nippon Mining Co., Ltd. Cascade FET logic circuits. 4,797,565, Cl. 307-450.000.
Laerdal, Tore; Aamodth, Kjell; and Eikeland, Harald, to Asmund S. Laerdal. System and method of testing a person in the performance of cardiopulmonary resuscitation. 4,797,104, Cl. 434-265.000.
Lahalih, Shawqui; and Absi-Halabi, Ma'mun, to Kuwait Institute for Scientific Research. Utilization of melamine waste effluent. 4,797,433, Cl. 524-3.000.
Lahde, Frank U., to Alten Corporation, The. Indicating liquid funnel. 4,796,470, Cl. 73-294.000.
Lahr, Roy J., to Creative Associates. Ribbon indicia system. 4,797,016, Cl. 400-237.000.
Lai, John T.: *See*—
Kletecka, George; Lai, John T.; and Son, Pyong-Nae, 4,797,438, Cl. 524-100.000.
Laib, Wilhelm. Sailboat. 4,796,554, Cl. 114-39.100.
Lailach, Gunter; and Schultz, Karl-Heinz, to Bayer Akteingesellschaft. Process for the production of titanium dioxide pigments. 4,797,163, Cl. 166-437.000.
l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Amen, Jean; and Cabau, Michel, 4,797,364, Cl. 435-243.000.
Lake, David E., Jr.: *See*—
Witek, Francis A.; and Lake, David E., Jr., 4,797,836, Cl. 364-518.000.
Lakin, David F.: *See*—
Parker, Dennis W.; and Lakin, David F., 4,796,655, Cl. 137-83.000.
La Mar, Charles R., to United States of America, Air Force. High energy laser target plate. 4,797,555, Cl. 250-336.100.
Lambda Physik: *See*—
Klopotek, Peter, 4,797,888, Cl. 372-38.000.
Lambert Corporation: *See*—
Steed, Jeffrey A.; Ruhl, Walter F.; and Weaver, James M., 4,796,322, Cl. 15-79.00A.
Lambert, Roger T. Board to board flexible pin. 4,797,113, Cl. 439-74.000.
Lameris, Herman J., to Shell Internationale Research Maatschappij B.V. Apparatus for heating steam formed from cooling water. 4,796,570, Cl. 122-7.00R.
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Landeck, Heiner; and Ranke, Gerhard, to Linde Aktiengesellschaft. Scrubbing of gas to recover light hydrocarbons. 4,797,140, Cl. 55-48.000.

Landry, John M.; and Ravenna, Paul L. Nautical chart for piloting. 4,796,920, Cl. 283-34.000.
Landsberger, Kurt. Dual magnetic stirring bar arrangement. 4,797,005, Cl. 366-343.000.
Lane, Larry R.: *See*—
Brors, Daniel L.; Lane, Larry R.; Goldsborough, Mark W.; Samsel, Jason M.; van Mastrigt, Max; and Foster, Robert, 4,796,562, Cl. 118-725.000.
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Lloyd, Peter G.; and Dadley, David A. Pattern detection in two dimensional signals. 4,797,941, Cl. 382-27.000.
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Loeffler, John M., to Dana Corporation. Synchronizer blocker pin mounting structure. 4,796,741, Cl. 192-53.00E.
Lofgren, Karl M. J., to Western Digital Corporation. Flip-flop with identical propagation delay in clock pass through mode and in normal operation. 4,797,575, Cl. 307-272.100.
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Manabe, Masamichi, to Pioneer Electronic Corporation. Lead frame including deformable plates. 4,797,726, Cl. 357-70.000.

Manfre, Pietro: *See*—
Pozzobon, Alessandro; and Manfre, Pietro, 4,796,829, Cl. 242-100.000.

Manghen S.r.l.: *See*—
Capra, Silvano, 4,796,902, Cl. 280-16.000.

Manisa Estabilishment: *See*—
Bron, Dan, 4,796,660, Cl. 137-504.000.

Mann, L. Arnold: *See*—
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Manning, William, to C-I-L Inc. Continuous bucket conveyor system. 4,796,748, Cl. 198-711.000.

Mantovani, Elia, to Tecnodelta S.A. Process for producing an electric arbor integrated with an induction motor. 4,796,353, Cl. 29-596.000.

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Marchand, Sam R.: *See*—
Trott, Arthur F.; and Marchand, Sam R., 4,796,624, Cl. 128-316.000.

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Sorbi, Robert T.; Caretta, Antonio; Cavaggioni, Andrea; and Marchesi Gastaldi, Liliana, 4,797,480, Cl. 536-27.000.

Marchetti, Steve. Fishtape feeding tool. 4,796,865, Cl. 254-134.3FT.

Marcus, William S.: *See*—
Bussey, Howard E., Jr.; Giacopelli, James N.; and Marcus, William S., 4,797,880, Cl. 370-60.000.

Marder, William: *See*—
Tsals, Izrail; Feygin, Ilya; and Marder, William, 4,796,463, Cl. 73-862.330.

Mardon Illingworth Limited: *See*—
Dudzik, Henryk, 4,796,775, Cl. 220-92.000.

Marks, Curtis G.: *See*—
Szlam, Aleksander; Crooks, James W., Jr.; and Marks, Curtis G., 4,797,911, Cl. 379-67.000.

Marks, Marc K.: *See*—
Aguillen, Domingo V., Jr.; Casares, Pete P.; DeForrest, John E.; Green, Kevin C.; Kavanagh, Rocque A.; Wilkinson, Bryan; Marks, Marc K.; and Zuniga, Gerardo, 4,796,347, Cl. 29-280.000.

Marpel, Virgil A., to University of Minnesota, Regents of the. Personal air sampling impactor. 4,796,475, Cl. 73-863.220.

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Galvin, Mark W., 4,796,835, Cl. 244-3.290.

Marquet, Guy: *See*—
Comera, Jean; Contamin, Pierre; Favier, Jean-Jacques; and Marquet, Guy, 4,797,174, Cl. 156-616.100.

Marshall, Lee, to Slautterback Corporation. Viscous fluid spraying apparatus having a unitary nozzle. 4,796,813, Cl. 239-425.000.

Marten, Finn L.; and Famili, Amir, to Air Products and Chemicals, Inc. Low foaming, high weaving efficiency polyvinyl alcohol size composition. 4,797,127, Cl. 8-115.600.

Martin Automatic Fishing Reel Co., Inc.: *See*—
Sheppard, William G., 4,796,831, Cl. 242-212.000.

Martin, James W.: *See*—
Hudson, Tommy E.; and Martin, James W., 4,796,701, Cl. 166-278.000.

Martin, Jerold: *See*—
Matkovich, Vlado I.; Martin, Jerold; and Degen, Peter J., 4,797,259, Cl. 422-101.000.

Martin, Wayne A. Tungsten-halogen heater. 4,797,535, Cl. 219-338.000.

Martinez, Aldo A., to Racal Data Communications Inc. Method and apparatus for equalization of data transmission system. 4,797,898, Cl. 375-7.000.

Martini, Norbert; and Naudascher, Peter, to Jagenberg Aktienbesellschaft. Method and apparatus for stacking sheets conveyed continuously to a stacking point. 4,796,879, Cl. 271-218.000.

Martiny, Ingo A., to U.S. Philips Corporation. Circuit for converting tri-state signals into binary signals. 4,797,581, Cl. 307-475.000.

Martorella, Romeo P.; and Chin, Jimmie, to Grumman Aerospace Corporation. Flight control optimization system for multi-control surface aircraft. 4,797,829, Cl. 364-434.000.

Maruyama, Masatoshi; Hasegawa, Yukinobu; and Tange, Toyokichi, to Nippon Carbide Koyo Kabushiki Kaisha. Toner for developing electrostatic images. 4,797,339, Cl. 430-109.000.

Maruyama, Teruo: *See*—
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Marxer, Herbert, to Lange International, SA. Device for closing a boot. 4,796,337, Cl. 24-68.0SK.

Marzari, Robert L.; Southard, Robert K.; and Stape, William J., to AMP Incorporated. Optical continuity testing apparatus with pulsating transmitter. 4,797,556, Cl. 250-551.000.

Maschinenfabrik Schweiter AG: *See*—
Rebsamen, Arthur; and Hablutzel, Bruno, 4,796,418, Cl. 57-22.000.

Mascuch, Frank; and Winter, Arthur, to Victory Engineering Company. Radiopaque marker for stereotaxic catheter. 4,796,637, Cl. 128-658.000.

Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Electrochemical element. 4,797,194, Cl. 204-425.000.

Mashiko, Koichiro: *See*—
Matsumoto, Noriaki; Mashiko, Koichiro; Arimoto, Kazutami; Furutani, Kiyohiro; and Matsuda, Yoshio, 4,797,001, Cl. 365-189.000.

Masina, Vittorio: *See*—
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Mason, Ronald A., to Smiths Industries Public Limited Company. Pyrometer systems for gas-turbine engines. 4,797,006, Cl. 374-130.000.

Massey, James L.; and Rueppel, Rainer A., to Borer Electronics AG. Method of, and apparatus for, transforming a digital data sequence into an encoded form. 4,797,922, Cl. 380-46.000.

MasterCard International, Inc.: *See*—
Stein, Theodore, 4,797,920, Cl. 380-24.000.

Mastromoro, John F.; French, Richard W.; and Strobert, Samuel S. Remotely programmable telephone answering system with immediate verification upon entry. 4,797,909, Cl. 379-67.000.
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Ueno, Masahiro; Kurita, Kozaburo; Masuda, Ikuro; and Miyakawa, Nobuaki, 4,797,583, Cl. 307-475.000.
Masuda, Yutaka, to Yamaha Hatsudoki Kabushiki Kaisha. Automatic speed control system for motorcycles. 4,796,716, Cl. 180-176.000.
Masuhara, Toshiaki: *See*—
Ishibashi, Koichiro; Minato, Osamu; Masuhara, Toshiaki; Sakai, Yoshio; Yamanaka, Toshiaki; Hashimoto, Naotaka; Hanamura, Shoji; Moriwaki, Nobuyuki; Honjyo, Shigeru; and Ueda, Kiyotsugu, 4,797,717, Cl. 357-23.100.
Mathes, Josef, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet turning device for rotary presses of the in-line type. 4,796,529, Cl. 101-230.000.
Matkovich, Vlado I.; Martin, Jerold; and Degen, Peter J., to Pall Corporation. Well-type diagnostic plate device. 4,797,259, Cl. 422-101.000.
Matracia, Anthony: *See*—
Linda, John W.; and Matracia, Anthony, 4,796,808, Cl. 239-175.000.
Matsubara, Toshihiko; and Fujiwara, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Wear resistant slide member made of iron-base sintered alloy. 4,796,575, Cl. 123-90.440.
Matsuda, Hari: *See*—
Heuer, William H.; and Matsuda, Hari, 4,797,697, Cl. 354-75.000.
Matsuda, Hiroshi: *See*—
Nishimura, Yukuo; Haruta, Masahiro; Hirai, Yutaka; Sakai, Kunihiro; and Matsuda, Hiroshi, 4,796,981, Cl. 350-353.000.
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Matsuda, Yoshio: *See*—
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Matsui, Shigeru; Onodera, Takashi; Sekihara, Kensuke; Shiono, Hidemi; and Kohno, Hideki, to Hitachi, Ltd. High speed NMR spectroscopic imaging method. 4,797,616, Cl. 324-309.000.
Matsui, Shigetomo: *See*—
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.
Matsui, Yuji: *See*—
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Matsumoto, Akio: *See*—
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Matsumoto, Iori: *See*—
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Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.
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Matsuno, Kazuhiro, deceased; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,797,493, Cl. 548-312.000.
Matsuno, Kazuhiro, deceased (by Matsuno, Chieko, legal representative); Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, to Ajinomoto Co., Inc. Benzylidene compounds. 4,797,493, Cl. 548-312.000.
Matsuo, Hideshige: *See*—
Furushima, Kiyoshi; Haratoh, Kazunori; and Matsuo, Hideshige, 4,796,671, Cl. 138-140.000.
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Matsushita, Akitake: *See*—
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Dischert, Lee R.; and Topper, Robert J., 4,797,731, Cl. 358-17.000.
Kitabatake, Makoto; Setsune, Kentaro; and Wasa, Kiyotaka, 4,796,982, Cl. 350-356.000.
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Takai, Hitoshi; and Morotomi, Noriaki, 4,797,735, Cl. 358-86.000.
Takita, Masaaki; Tsuru, Yoshikazu; Ushihara, Masaharu; Itoh, Taichi; and Tanaka, Masumi, 4,797,690, Cl. 346-105.000.
Usui, Akira; Kubo, Kazuhiko; and Nagai, Hiroyuki, 4,797,638, Cl. 331-117.00D.
Matsushita Electric Works, Ltd.: *See*—
Katayama, Susumu, 4,796,725, Cl. 181-142.000.
Matsushita Electronics Corporation: *See*—
Ueda, Seiji, 4,797,719, Cl. 357-23.600.
Matsuura, Hideo: *See*—
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Matsuura, Tooru; Ishida, Noboru; and Kawamura, Mitsuyoshi, to NGK Spark Plug Co., Ltd. Adjustment mechanism for ceramic rocker arm. 4,796,576, Cl. 123-90.430.
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Matthews, Hugoe R.; and Fischer, Huw B. J. Tracheostomy tube assembly. 4,796,617, Cl. 128-204.250.
Mattin, Harry E., to Mearl Corporation, The. Simulated mother-of-pearl. 4,797,308, Cl. 428-15.000.
Mattson, Glenn H., to Omaha Cold Storage Terminals, Inc. By-products chiller and method for using same. 4,796,435, Cl. 62-63.000.
Mauser-Werke Oberndorf GmbH: *See*—
Bertiller, Roland, 4,796,535, Cl. 102-446.000.
Maxemchuk, Nicholas F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Mesh-based switching network. 4,797,882, Cl. 370-94.000.
Maxim Integrated Products: *See*—
Boyacigiller, Ziya G., 4,797,569, Cl. 307-297.000.
Maxim Integrated Products, Inc.: *See*—
Fuller, Roger W.; and Bingham, David, 4,797,899, Cl. 375-7.000.
Mayer, Andreas: *See*—
El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.
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Mazda Motor Corporation: *See*—
Fukutomi, Hisao; Tuchiya, Takanori; Yamamoto, Takeshi; Konishi, Takeshi; and Hamasaki, Iseo, 4,796,943, Cl. 296-65.100.
Nagamatsu, Hiroaki; and Ebisumoto, Takashige, 4,796,489, Cl. 74-868.000.
McClung, James A.: *See*—
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McCormack, John J.: *See*—
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McDonough, Kevin C.: *See*—
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McEntee, Timothy J.; Bloemer, Robert W.; Oxley, Donald W.; and Thatte, Satish M., to Texas Instruments Incorporated. Incremental, multi-area, generational, copying garbage collector for use in a virtual address space. 4,797,810, Cl. 364-200.000.
McFarland, James W.: *See*—
Glazer, Edward A.; and McFarland, James W., 4,797,486, Cl. 544-250.000.
McFarland, Robert E. Wheelchair loading apparatus. 4,797,042, Cl. 410-3.000.
McGovern, John J.; Pendergraft, Paul T.; and Lee, Min-Hsiun, to Amoco Corporation. Sulfur recovery process using metal oxide absorbent with regenerator recycle to Claus catalytic reactor. 4,797,268, Cl. 423-574.00R.
McGovern, Terrence P.; and Burden, George S., to United States of America, Agriculture. Cockroach repellents. 4,797,408, Cl. 514-315.000.
McGowan, David L., III; Olsen, Arthur M.; and Oxenberg, Steven M., to Honeywell Inc. Receiver. 4,797,669, Cl. 340-870.400.
McGuirk, Paul R.: *See*—
Gilligan, Paul J.; McGuirk, Paul R.; and Witty, Michael J., 4,797,490, Cl. 546-290.000.
McKeown, Frank R. Pressure applicator. 4,796,767, Cl. 215-11.100.
McLaren, Barry D.: *See*—
Huntsman, Lee L.; Leard, Richard S.; Tarbox, Gary L.; Barnes, Stephen R.; and McLaren, Barry D., 4,796,634, Cl. 128-662.010.
McLean, Ralph M., Jr.; and Bates, James C. Hold down bar for rail car hatch covers. 4,796,538, Cl. 105-377.000.
McWillis, Harlan. Musical instrument. 4,796,504, Cl. 84-265.000.
Mead Corporation, The: *See*—
Chaussadas, Jean; and Le Bras, Philippe, 4,796,754, Cl. 206-434.000.
Mead, Howard, to Greenlee Textron Inc. Hydraulic crimping tool. 4,796,461, Cl. 72-453.160.
Meadows, James M.: *See*—
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Mearl Corporation, The: *See*—
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Snow, Michael G.; Tyler, William R.; Hsu, Sung-Peng; and Fallat, Robert J., 4,796,639, Cl. 128-719.000.
Meehan, Kathleen: *See*—
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Meier, Frankie G.: *See*—
Billings, Robert L.; Bowers, Mark A.; and Meier, Frankie G., 4,797,541, Cl. 235-449.000.
Meier, Hans; and Aussenberg, Nash, to Automated Medical Products, Corporation. Retaining device for a surgical instrument. 4,796,846, Cl. 248-286.000.
Meier, Hermann; and Franzolin, Jean-Paul, to Cafina AG. Piston-cyclinder-assembly for a coffee brewing apparatus and a method of its operation. 4,797,296, Cl. 426-433.000.
Meinan Machinery Works, Inc.: *See*—
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Meland, Ronald F.: *See*—
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Menard, Richard J. Apparatus and method for unscrewing a bicycle chain sprocket. 4,796,493, Cl. 81-65.200.
Menchetti, Robert J., to National Gypsum Company. Integral wallboard and stud. 4,796,396, Cl. 52-127.500.
Mercader, Juan P.; and Villamanan, Pablo R., to Carburos Metalicos S.A. Method for obtaining CO_2 and N_2 from internal combustion engine or turbine generated gases. 4,797,141, Cl. 62-17.000.
Merck & Co., Inc.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,797,413, Cl. 514-432.000.
Finke, Paul E.; Zimmerman, Morris; Doherty, James B.; Ashe, Bonnie Mae; and Dorn, Conrad P., 4,797,396, Cl. 514-210.000.
Loper, Alice E.; and Majumdar, Anup K., 4,797,284, Cl. 424-449.000.
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Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
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Merkel, Paul B.: *See*—
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Merrell, Gene A.; and Sujdak, Richard J., to Betz Laboratories, Inc. Method of conditioning fireside fouling deposits using super large particle size magnesium oxide. 4,796,548, Cl. 110-343.000.
Merritt, Timothy K. Apparatus for holding and dispensing beverages. 4,796,785, Cl. 222-131.000.
Mertens, Theobald; and Roos, Jurgen, to General Motors Corporation. Hydraulic mounting. 4,796,875, Cl. 267-140.100.
Messerschmitt-Boelkow Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Bohn, Gerhard; Steinmetz, Guenter; and Steenbeck, Ulf, 4,796,724, Cl. 181-106.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
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Metal Building Components Incorporated: *See*—
Fulton, David A.; and Boen, Jerry D., 4,796,403, Cl. 52-713.000.
Methode Electronics, Inc.: *See*—
Wende, Russell E., 4,797,109, Cl. 439-15.000.
Mette, Manfred, to Nordischer Maschinenbau Rud. Baader GmbH + Co. Installation for the continuous heat treatment of foodstuffs. 4,796,523, Cl. 99-470.000.
Metz, Arthur J., to Tektronix, Inc. Trigger re-synchronization circuit. 4,797,572, Cl. 307-269.000.
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Metzner, Klaus; Westphal, Detlef; Allendorfer, Wolfgang; Hahnel, Reinhard; and Polaschegg, Hans-Dietrich, to Fresenius AG. Measuring device for determination of the activity or of the concentration of ions in solutions. 4,797,191, Cl. 204-411.000.
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Hagen, Helmut; Eichenauer, Ulrich; Plath, Peter; Meyer, Norbert; and Wuerzer, Bruno, 4,797,148, Cl. 71-94.000.
Meyer, Rudolph; and Specht, Martin, to BSRD Limited. Automatic rewinding type safety belt retractors. 4,796,918, Cl. 280-806.000.
Meyers, Richard G., to National Telephone Supply Co., The. Wire tensioner. 4,796,338, Cl. 24-68.00R.
Michaels, John. Grooving apparatus. 4,796,682, Cl. 144-371.000.
Michel, Dominique: *See*—
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Micropolis Corporation: *See*—
Levy, Lloyd; Kilmer, Dan L.; and Maher, Kevin P., 4,797,762, Cl. 360-99.060.
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Micropore International Ltd.: *See*—
Hughes, John T., 4,797,082, Cl. 425-356.000.
Midwesco, Inc.: *See*—
Anderson, Arthur L.; Bailey, Douglas S.; and Korinek, Richard J., 4,797,621, Cl. 324-533.000.
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Mieno, Toshiyuki: *See*—
Tanaka, Akira; Nagao, Akira; Suzaki, Yukihiko; Yamada, Hideji; Nakajima, Toyohei; and Mieno, Toshiyuki, 4,796,586, Cl. 123-425.000.
Mihelich, John L., to Amax, Inc. Device for joining superconducting wire. 4,797,510, Cl. 174-94.00R.
Miihkinen, Veijo, to Valmet Oy. Press roll for paper making machines. 4,796,342, Cl. 29-132.000.
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Miki, Yoshiaki; and Ueda, Tsunehisa, to Nippon Zeon Co., Ltd. Composition comprising copper compound. 4,797,274, Cl. 424-76.100.
Miko, Hans-Jurgen: *See*—
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Miller, Dale A. Descaling and anti-oxidizing composition and process therefor. 4,797,220, Cl. 252-82.000.
Miller, Douglas J. Method of repairing a binding post. 4,796,349, Cl. 29-402.080.
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Kukes, Simon G.; Gutberlet, L. Charles; and Miller, Jeffrey T., 4,797,195, Cl. 208-59.000.
Miller, Larry D., to General Motors Corporation. Passive seat belt system. 4,796,917, Cl. 280-804.000.
Miller, Leslie A.: *See*—
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Miller, Maria L.: *See*—
Lee, Len F.; and Miller, Maria L., 4,797,149, Cl. 71-94.000.
Miller, Paul D., to Chrysler Motors Corporation. Electronic oil pressure sensor device. 4,796,464, Cl. 73-115.000.
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Patel, Ramanlal L.; and Mills, Jesse V., 4,796,483, Cl. 74-519.000.
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Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,797,180, Cl. 204-1.00T.
Minnesota Mining and Manufacturing Company: *See*—
Doering, Arlin B., 4,797,764, Cl. 360-135.000.
Montgomery, Joseph D., 4,797,753, Cl. 360-27.000.
Sowman, Harold G., 4,797,378, Cl. 501-95.000.
Windorski, David C., 4,796,781, Cl. 221-45.000.
Minolta Camera Kabushiki Kaisha: *See*—
Iino, Syuji; Hotomi, Hideo; Saeki, Noboru; Fujiwara, Masanori; Uchino, Fumiko; and Osawa, Izumi, 4,797,338, Cl. 430-58.000.
Nishioka, Nobuaki, 4,797,705, Cl. 355-14.0CH.
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,797,702, Cl. 354-413.000.
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Bini, Dante; Bogliari, Domenico; Lomoro, Sandro; Minozzi, Daniele; Pietrogrande, Stefano; and Zucchi, Dario, 4,796,389, Cl. 52-2.000.
Mintz, Michael, to International Technidyne Corp. Method and apparatus for detecting a blood clot. 4,797,369, Cl. 436-69.000.
Mir, Jose M.: *See*—
Agostinelli, John A.; and Mir, Jose M., 4,797,694, Cl. 346-160.000.
Mirbod, Ali: *See*—
El-Amawy, Ahmed; and Mirbod, Ali, 4,797,833, Cl. 364-483.000.
Misawa, Atsushi: *See*—
Nemoto, Ichiro; Aosaki, Ko; Misawa, Atsushi; and Otora, Takahito, 4,797,699, Cl. 354-246.000.
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Mitchell, Rodger. Readily adjustable grip enhancing gripping glove. 4,796,306, Cl. 2-160.000.
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Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; and Sanada, Yuji, 4,797,088, Cl. 431-15.000.

Mitsubishi Cable Industries, Ltd.: *See*—
Inaba, Fumio; Ito, Hiromasa; Onodera, Noriaki; and Mizuyoshi, Akira, 4,797,890, Cl. 372-46.000.
Mitsubishi Denki, K.K.: *See*—
Nishimura, Tadashi; and Akasaka, Yoichi, 4,797,723, Cl. 357-40.000.
Mitsubishi Denki Kabushiki Daisha: *See*—
Kegasa, Koyo; Murai, Takafumi; Yamanaka, Osamu; and Fujii, Takeshi, 4,797,637, Cl. 331-4.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hamada, Takashi; Hino, Teruyuki; Nodama, Takashi; and Matsuoka, Hiroshi, 4,796,842, Cl. 248-186.000.
Kiyokawa, Morio; and Fujimoto, Akihiko, 4,797,811, Cl. 364-200.000.
Kokubo, Yoshihiro; and Susaki, Wataru, 4,797,895, Cl. 372-43.000.
Matsumoto, Noriaki; Mashiko, Koichiro; Arimoto, Kazutami; Furutani, Kiyohiro; and Matsuda, Yoshio, 4,797,001, Cl. 365-189.000.
Nakazaki, Katsuichi; and Nonoyama, Yasumasa, 4,797,854, Cl. 364-900.000.
Niwayama, Kazuhiko, 4,797,727, Cl. 357-79.000.
Saito, Masato; Fukuyama, Keiji; Ishida, Masako; Watanabe, Keiji; Kamata, Toyokazu; and Sano, Kinjiro, 4,797,593, Cl. 313-346.00R.
Segawa, Hiroshi; and Matsumura, Tetsuya, 4,797,585, Cl. 307-594.000.
Shikama, Shinsuke; Kondo, Mitsushige; and Toide, Eiichi, 4,797,545, Cl. 250-201.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,796,588, Cl. 123-479.000.
Umehara, Seiji; and Sakai, Katsuyoshi, 4,797,106, Cl. 434-408.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hashizaki, Katsuo; Koyanagi, Toshio; and Morii, Atsushi, 4,796,545, Cl. 110-216.000.
Mitsubishi Mining & Cement Co., Ltd.: *See*—
Uetsuhara, Tokio, 4,797,645, Cl. 335-230.000.
Mitsuhashi, Sinji: *See*—
Hayakawa, Tadashi; Shiinoki, Kazuaki; Mitsuhashi, Sinji; and Naya, Kotaro, 4,797,068, Cl. 417-201.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kaya, Toshio; and Fujimoto, Makoto, 4,797,177, Cl. 156-630.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Fukuda, Yoshiaki; Miyasaka, Takeshi; Matsumoto, Iori; Kato, Nobukatsu; and Ema, Kenji, 4,797,242, Cl. 264-108.000.
Inoue, Tadashi; Ohkoba, Akira; Sakashita, Kunio; Utsunomiya, Akira; Shinozaki, Takeki; and Ieda, Minoru, 4,797,265, Cl. 423-320.000.
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.
MIU Automation: *See*—
Dykes, John, 4,797,928, Cl. 380-49.000.
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Miwa, Takashi: *See*—
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Miyakawa, Nobuaki: *See*—
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Miyake, Akio; Yoshimura, Yoshinobu; and Numata, Mitsuo, to Takeda Chemical Industries, Ltd. 1-Acyloxyalkyl esters of cephalosporin. 4,797,395, Cl. 514-206.000.
Miyake, Akira: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,797,321, Cl. 428-328.000.
Miyake, Katsuya: *See*—
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Miyaoka, Kazuyoshi: *See*—
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Miyasaka, Takeshi: *See*—
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Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,797,321, Cl. 428-328.000.
Miyazaki, Haruhito, to Pioneer Electronic Corporation. Video memory control device. 4,797,743, Cl. 358-149.000.
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Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.
Miyazawa, Hideo; Andoh, Ikuhiro; Koyama, Hiromichi; and Kobayashi, Mitsuru, to Fujitsu Limited. Insulation displacement connection (IDC) type cable connector and a method for assembling a cable thereto. 4,797,119, Cl. 439-395.000.
Miyoshi, Takeshi: *See*—
Matsuno, Kazuhiro, deceased; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,797,493, Cl. 548-312.000.
Mizuguchi, Masaaki; and Kuroyanagi, Hirohisa, to Yamaha Corporation. Electronic tuning apparatus. 4,796,509, Cl. 84-454.000.
Mizuyoshi, Akira: *See*—
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MKS Instruments, Inc.: *See*—
Ewing, James H., 4,796,854, Cl. 251-129.070.
Mobark, Bengt U., to W. R. Grace & Co. Method and apparatus for vacuum packaging. 4,796,408, Cl. 53-427.000.
Mobay Corporation: *See*—
Nodelman, Neil H., 4,797,464, Cl. 528-110.000.
Reichmann, Wolfgang W., 4,797,428, Cl. 521-137.000.
Mobil Oil Corporation: *See*—
Kuehl, Guenter H., 4,797,267, Cl. 423-329.000.
Quaglino, Carl A., 4,797,860, Cl. 367-47.000.
Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Chemical reaction apparatus. 4,797,258, Cl. 422-65.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei, 4,797,258, Cl. 422-65.000.
Moest, Thomas: *See*—
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Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Molinier, Michel: *See*—
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Momiyama, Fujio, to Hino Jidosha Kogyo Kabushiki Kaisha. Power steering system for use in large vehicle. 4,796,714, Cl. 180-143.000.
Monsanto Company: *See*—
Lee, Len F.; and Miller, Maria L., 4,797,149, Cl. 71-94.000.
Stolk, Richard D.; and Bekker, Vladimir O., 4,797,313, Cl. 428-156.000.
Monson, Donald B.: *See*—
Clark, Michael R.; Kuipper, Gerald J.; Monson, Donald B.; and Tringali, Dominick, 4,797,516, Cl. 200-51.00R.
Montenecourt, Bland S., to Lehigh University. Microorganism and process. 4,797,361, Cl. 435-198.000.
Montgomery, James R.; Figueroa, John A.; and White, George. Optical scanner including position sensors. 4,797,544, Cl. 250-221.000.
Montgomery, Joseph D., to Minnesota Mining and Manufacturing Company. Monitor for visually indicating wear on record media. 4,797,753, Cl. 360-27.000.
Moog Inc.: *See*—
Toews, Hans G., 4,796,664, Cl. 137-595.000.
Moore, Alan H.: *See*—
Scott, Michael D.; and Moore, Alan H., 4,797,374, Cl. 437-129.000.
Moore, Duncan T.: *See*—
Caldwell, J. Brian; and Moore, Duncan T., 4,797,376, Cl. 501-12.000.
Moore, Mark R. Dolly for line trimming apparatus. 4,796,415, Cl. 56-16.900.
Moore, Paul E.; Henderson, Jeffrey S.; Soisson, Lawrence R.; and Toth, Andrew J., to Arcair Company. Vacuum carbon arc metal removal process and apparatus. 4,797,528, Cl. 219-70.000.
Moore, Wayne T., to Paradyne Corporation. Interleaved synchronous bus access protocol for a shared memory multi-processor system. 4,797,815, Cl. 364-200.000.
Moos, Walter H.; and Thomas, Anthony J., to Warner-Lambert Company. Method of treating the symptoms of senile cognitive decline employing di- or trisubstituted urea cholinergic agents. 4,797,419, Cl. 514-588.000.
Moreau, Philippe, to Framatome. Nuclear reactor confinement enclosure foundation. 4,797,250, Cl. 376-293.000.
Moreland, Margaret: *See*—
Nitecki, Danute E.; and Moreland, Margaret, 4,797,491, Cl. 546-291.000.
Moret, Jacques; Fosset, Jean-Maurice; Couturier, Jacques; and Viard, Noel, to Compagnie Generale des Matieres Nucleaires. Apparatus and method for regenerating active carbon. 4,797,524, Cl. 219-10.690.
Morgan, Peter J.: *See*—
Carreno, Diether E.; and Morgan, Peter J., 4,796,465, Cl. 73-116.000.
Mori, Kei. Solar ray energy radiation device for use in medical treatment. 4,796,967, Cl. 350-96.100.
Mori, Kinji: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.
Mori, Yasukazu: *See*—
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Morii, Atsushi: *See*—
Hashizaki, Katsuo; Koyanagi, Toshio; and Morii, Atsushi, 4,796,545, Cl. 110-216.000.
Morinaga Milk Industry Co., Ltd.: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.
Morinaga, Tetsuya: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.

Morita, Toyoo, to Yoshida Kogyo K. K. Method and apparatus for cutting a chain of elongate products. 4,796,497, Cl. 83-23.000.
Moriwaki, Nobuyuki: *See*—
Ishibashi, Koichiro; Minato, Osamu; Masuhara, Toshiaki; Sakai, Yoshio; Yamanaka, Toshiaki; Hashimoto, Naotaka; Hanamura, Shoji; Moriwaki, Nobuyuki; Honjyo, Shigeru; and Ueda, Kiyotsugu, 4,797,717, Cl. 357-23.100.
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of N'-sulphonyl- and N',N''-bis-sulphonyl-guanidine derivatives. 4,797,484, Cl. 544-215.000.
Morotomi, Noriaki: *See*—
Takai, Hitoshi; and Morotomi, Noriaki, 4,797,735, Cl. 358-86.000.
Morris, Alvan. Dental identification system. 4,797,101, Cl. 433-229.000.
Morsbach, Martin: *See*—
Brauers, Bert; and Morsbach, Martin, 4,796,898, Cl. 277-216.000.
Morton Thiokol, Inc.: *See*—
Lauritzen, Donald R.; and Goin, Gregory R., 4,796,912, Cl. 280-736.000.
Moser, Thomas; Otto, Klaus; Kippenberg, Horst; Ramler, Johann; and Unterlass, Josef, to Siemens Aktiengesellschaft. Component with filled layers and electrical contacts and methods for its production. 4,797,780, Cl. 361-321.000.
Moskowitz, Ronald: *See*—
Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, 4,797,013, Cl. 384-462.000.
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, to Kikkoman Corporation; and Fuji-Davison Chemical, Ltd. Microorganism or enzyme immobilization with a mixture of alginate and silica sol. 4,797,358, Cl. 435-176.000.
Motohashi, Toshiaki; and Saisu, Yasushi, to Tokyo Tatsuno Co., Ltd. Liquid delivery apparatus. 4,796,678, Cl. 141-206.000.
Motohiro, Simizu, to Honda Giken Kogyo Kabushiki Kaisha. Power regulating system for an engine generator. 4,797,800, Cl. 363-37.000.
Motoo, Satoshi; and Watanabe, Masahiro, to Motoo, Satoshi; Watanabe, Masahiro; and Tanaka Kikinzoku Kogyo K.K. Method for producing highly dispersed catalyst. 4,797,380, Cl. 502-159.000.
Motorola, Inc.: *See*—
Anderson, Steven L., 4,797,900, Cl. 375-8.000.
Gerson, Ira A.; Lindsley, Brett L.; and Smanski, Philip J., 4,797,929, Cl. 381-43.000.
Hing, Sam A., 4,797,577, Cl. 307-297.000.
Labedz, Gerald P., 4,797,947, Cl. 455-33.000.
Milliorn, Gary W.; and Bromley, Steven D., 4,797,948, Cl. 455-54.000.
Wang, Karl L.; and Sood, Lal C., 4,797,858, Cl. 365-230.000.
Moustakas, Steven: *See*—
Goerne, Jan; Kozilek, Joseph; and Moustakas, Steven, 4,797,901, Cl. 375-10.000.
Mrotz, Walter C., III; Cool, Donald L.; and Liebertz, Fred C., to Haworth, Inc. Tilt mechanism, particularly for knee-tilt chair. 4,796,950, Cl. 297-302.000.
Mueller, William A.; and Hoffmann, Wolfgang, to General Motors Corporation. Accumulator system for closed die forging. 4,796,459, Cl. 72-354.000.
Mulder, Lawrence, to ODL, Incorporated. Skylight with improved seal. 4,796,400, Cl. 52-200.000.
Munakata, Tadashi, to Kabushiki Kaisha Toshiba. Multi-jointed robot. 4,797,061, Cl. 414-744.500.
Munchmeyer, Dietrich: *See*—
Ehrfeld, Wolfgang; and Munchmeyer, Dietrich, 4,797,211, Cl. 210-321.840.
Mungall, Dennis R.: *See*—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,797,283, Cl. 424-443.000.
Munini, Dino, to Protec Pordenonese S.p.A. Watertight joint for flexible pipes. 4,796,856, Cl. 251-149.500.
Munt, Dean J., III; and Munt, Nancy J. Combination kite control and reel device. 4,796,827, Cl. 242-96.000.
Munt, Nancy J.: *See*—
Munt, Dean J., III; and Munt, Nancy J., 4,796,827, Cl. 242-96.000.
Mura, Albert J.; and Merkel, Paul B., to Eastman Kodak Company. Light-stable reducible compounds and analytical compositions, elements and methods utilizing same. 4,797,357, Cl. 435-34.000.
Murai, Keiichi: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,299, Cl. 430-65.000.
Honda, Mitsuru; Sueda, Tetsuo; Murai, Keiichi; and Ogawa, Kyosuke, 4,797,327, Cl. 428-600.000.
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,336, Cl. 430-57.000.
Murai, Takafumi: *See*—
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Murakami, Toshio: *See*—
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Muranaka, Yoshiyuki: *See*—
Fujii, Setsuro; Ogawa, Kazuo; Hamakawa, Toshihiro; and Muranaka, Yoshiyuki, 4,797,502, Cl. 558-52.000.
Muraour, Renaud. Tip for tennis racket handle and the like, and racket equipped with this tip. 4,796,889, Cl. 273-73.003.
Murase, Zenzaburo: *See*—
Hiramitsu, Tetsushi; Ono, Satoshi; Hirano, Atsuo; and Murase, Zenzaburo, 4,796,482, Cl. 74-492.000.
Murata Manufacturing Co., Ltd.: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.
Okubo, Akira; and Sasaki, Kenichi, 4,797,647, Cl. 336-175.000.
Murata, Masae: *See*—
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Murayama, Noboru; and Shimura, Hiroshi, to Ricoh Company, Ltd. Gradation data processing apparatus. 4,797,943, Cl. 382-54.000.
Murayama, Noboru: *See*—
Sato, Kei; and Murayama, Noboru, 4,797,809, Cl. 364-200.000.
Murofushi, Toshiaki: *See*—
Tanaka, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; Murofushi, Toshiaki; and Kimura, Takaaki, 4,797,340, Cl. 430-109.000.
Murray, Bruce; Guillou, Louis; and Coutrot, Francoise M. R., to U.S. Philips Corporation; Etablissement Public de Diffusion de France; and Etat Francais. Receiver having an interface with a sub-system. 4,797,919, Cl. 380-20.000.
Murray Europe S.p.A.: *See*—
Bona, Alfredo D.; and Airaghi, Attilio, 4,796,927, Cl. 285-190.000.
Murray, Patrick M., to General Motors Corporation. Articulated air vane arrangement. 4,796,518, Cl. 98-2.000.
Mushika, Sadahiko, to Aisin Seiki Kabushiki Kaisha. Drive unit for medical pump. 4,796,606, Cl. 600-18.000.
Mushy, Roman Y.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Musil, James C.; and Zahuranec, Emery J., to Crawford Fitting Company. Workpiece holder and saw guide device. 4,796,877, Cl. 269-87.200.
Mutou, Kouichi: *See*—
Imai, Tooru; Mutou, Kouichi; Yamazaki, Hidetoshi; and Murata, Masae, 4,797,865, Cl. 369-39.000.
Mycogen Corporation: *See*—
Herrnstadt, Corinna; and Soares, George G., 4,797,276, Cl. 424-84.000.
Myerly, Richard C.; Jorgenson, Michael W.; and Critchfield, Frank E., to Union Carbide Corporation. Silicone-based stabilizers useful in the preparation of improved polyurethane foams. 4,797,501, Cl. 556-445.000.
Nabinger, Richard, to Answer Company, The. Removable and resealable lid for a container. 4,796,774, Cl. 220-90.400.
Nabisco Brands, Inc.: *See*—
Coelho, Urban J., 4,797,010, Cl. 383-109.000.
Lynch, Joseph A., 4,796,522, Cl. 99-450.400.
Pomper, Seymour; Cole, Gary W.; and Davis, James R., 4,797,365, Cl. 435-256.000.
Nackman, Lee R.; and Srinivasan, Vijay, to International Business Machines Corporation. Method of generating finite elements using the symmetric axis transform. 4,797,842, Cl. 364-578.000.
Nadaud, Yvon: *See*—
Degobert, Paul; Goldenberg, Emmanuel; Nadaud, Yvon; and Molinier, Michel, 4,796,590, Cl. 123-489.000.
Nagai, Hiroyuki: *See*—
Usui, Akira; Kubo, Kazuhiko; and Nagai, Hiroyuki, 4,797,638, Cl. 331-117.00D.
Nagai, Tadao; and Sato, Kenichi, to TEAC Corporation. Optical recording and reproducing apparatus. 4,797,870, Cl. 369-100.000.
Nagai, Toshinari; and Kayanuma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system carrying out learning control operation. 4,796,425, Cl. 60-274.000.
Nagamatsu, Hiroaki; and Ebisumoto, Takashige, to Mazda Motor Corporation. Speed ratio control for a step-lessly variable vehicle transmission. 4,796,489, Cl. 74-868.000.
Nagamori, Hiroyuki: *See*—
Yamamoto, Yuzo; Nagamori, Hiroyuki; and Kitazawa, Kozo, 4,797,183, Cl. 204-16.000.
Nagao, Akira: *See*—
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Nagasaka, Kohji; Kobayashi, Takeshi; and Sejimo, Yoshimi, to Walbro Far East, Inc. Anti-overrunning device for an internal combustion engine. 4,796,578, Cl. 123-378.000.
Nagasaka, Kohji; Kobayashi, Takeshi; and Sejimo, Yoshimi, to Walbro Far East, Inc. Anti-overrunning device for an internal combustion engine. 4,796,583, Cl. 123-378.000.
Nagasawa, Yokichi: *See*—
Kishi, Mitsuhiro; and Nagasawa, Yokichi, 4,797,060, Cl. 414-687.000.
Nagler, Franz: *See*—
Thielen, Christoph; and Nagler, Franz, 4,796,718, Cl. 180-197.000.
Naitoh, Kazumi; Arakawa, Yoshiaki; and Ikezaki, Takashi, to Showa Denko Kabushiki Kaisha. Solid electrolytic capacitor. 4,797,789, Cl. 361-525.000.
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Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; Okumura, Hiroyuki; and Nakaguchi, Osamu, 4,797,399, Cl. 514-253.000.
Nakahara, Toshiaki; Ohsaki, Ichiro; Ushiyama, Hisayuki; Kiuchi, Masashi; Yamazaki, Masuo; Goseki, Yasuhide; and Ochi, Hisayuki, to

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Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.

Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,797,702, Cl. 354-413.000.

Nakajima, Toyohei; and Okada, Yasushi, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system for internal combustion engine. 4,796,587, Cl. 123-440.000.

Nakajima, Toyohei: *See*—
Tanaka, Akira; Nagao, Akira; Suzaki, Yukihiko; Yamada, Hideji; Nakajima, Toyobei; and Mieno, Toshiyuki, 4,796,586, Cl. 123-425.000.

Nakako, Takefumi; Inoue, Shoji; and Takezoe, Akinobu, to Nisshin Steel Co., Ltd. Method for making thin-walled metal pipes. 4,796,797, Cl. 228-144.000.

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Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.

Nakamura, Hitoshi: *See*—
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.

Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; and Sanada, Yuji, to Toyotomi Kogyo Co., Ltd. Safety device for oil burner. 4,797,088, Cl. 431-15.000.

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Nakamura, Tomio; Kikuchi, Katsuaki; and Inagaki, Takeshi, to Nitto Chemical Industry Co., Ltd. Process for producing 7,7,8,8-tetracyanoquinodimethane. 4,797,184, Cl. 204-59.00R.

Nakamura, Toshihiro: *See*—
Yamamoto, Kiyoshi; Nakamura, Toshihiro; Ito, Tadao; and Inui, Keiichiro, 4,797,230, Cl. 252-364.000.

Nakamura, Yoichi; Yamamoto, Shirushi; Komine, Takashi; Yokota, Akira; and Nakane, Hisashi, to Tokyo Ohka Kogyo Co., Ltd. Method of forming a positive resist pattern in photoresist of o-naphthoquinone diazide and bisazide with UV imaging exposure and far UV overall exposure. 4,797,348, Cl. 430-326.000.

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Nakane, Hisashi: *See*—
Nakamura, Yoichi; Yamamoto, Shirushi; Komine, Takashi; Yokota, Akira; and Nakane, Hisashi, 4,797,348, Cl. 430-326.000.

Nakane, Kazuo: *See*—
Aizawa, Tadashi; Nishiyama, Toshimichi; Okawa, Masaru; and Nakane, Kazuo, 4,797,169, Cl. 156-64.000.

Nakanishi Dental Mfg. Co., Ltd.: *See*—
Kawata, Shosaku, 4,797,098, Cl. 433-98.000.

Nakanishi, Nobuyasu; Noguchi, Noboru; Aizawa, Hideyuki; and Ito, Kenzi, to Toyota Jidosha Kabushiki Kaisha. Device for detecting rotating speed of vehicle wheel. 4,797,612, Cl. 324-173.000.

Nakanishi, Yutaka: *See*—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; and Sanada, Yuji, 4,797,088, Cl. 431-15.000.

Nakano, Hiraku, to Hitachi, Ltd. Pipelined vector divide apparatus. 4,797,849, Cl. 364-765.000.

Nakano, Miegi: *See*—
Yamamoto, Takeshi; Sasa, Nobumasa; and Nakano, Miegi, 4,797,346, Cl. 430-192.000.

Nakashima, Kunimichi: *See*—
Ohta, Takeshi; Kamiya, Yoji; Nakashima, Kunimichi; and Taniguchi, Mitsuyoshi, 4,797,052, Cl. 414-744.300.

Nakashima, Shouzaburo: *See*—
Nakayama, Hisanobu; Nakashima, Shouzaburo; Shimoyama, Yoshiaki; and Mori, Yasukazu, 4,797,167, Cl. 148-111.000.

Nakatsugawa, Kenji; Katayama, Aiichi; Sekiya, Hitoshi; and Hiratsuka, Shoji, to Anritsu Corporation. Waveform sequence trigger system. 4,797,936, Cl. 382-1.000.

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Nakayama, Hiromichi, to Nifco, Inc. Oil damper. 4,796,733, Cl. 188-291.000.

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Nakayama, Tadayoshi: *See*—
Sato, Chikara; Nakayama, Tadayoshi; Takahashi, Koji; and Sasatani, Tomohiko, 4,797,741, Cl. 358-138.000.

Nakayama, Takehisa: *See*—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,797,527, Cl. 219-69.00E.

Nakayama, Takeo; Inoue, Saburo; and Sakamoto, Takurou, to Takeda Chemical Industries, Ltd. Resin compositions. 4,797,449, Cl. 525-217.000.

Nakazaki, Katsuichi; and Nonoyama, Yasumasa, to Mitsubishi Denki Kabushiki Kaisha. Operating system for controlling man-machine interaction in information processing system. 4,797,854, Cl. 364-900.000.

Nakazawa, Akira; and Milijasevic, Zoran, to Telectronics N.V. Medical electrode leads. 4,796,643, Cl. 128-785.000.

Nakazawa, Kazuhiro: *See*—
Iwahashi, Haruo; and Nakazawa, Kazuhiro, 4,797,707, Cl. 355-14.00R.

Nakazawa, Satoshi, to NEC Corporation. Device for detecting bit phase difference. 4,797,625, Cl. 328-133.000.

Nalco Chemical Company: *See*—
Crucil, Guy A.; and Blaser, Laura J., 4,797,224, Cl. 252-181.000.
Gabel, Robert K.; and Law, Robert E., 4,796,703, Cl. 166-312.000.

Nanai, Sadaaki, to Eastman Kodak Company. Ultrasonic vibration driving type thermal printer. 4,797,689, Cl. 346-76.0PH.

Nanda, Sunil, to Intel Corporation. Block shifter for graphics processor. 4,797,852, Cl. 364-900.000.

Naomitsu Tokieda: *See*—
Homma, Dai, 4,797,649, Cl. 337-140.000.

Nartron Corporation: *See*—
Schnars, Michael J.; Dolph, Darrel A.; and Liu, Yu-Jih, 4,797,924, Cl. 381-43.000.

Naruse, Kohji: *See*—
Ono, Mamoru; Naruse, Kohji; and Okazaki, Toshio, 4,797,513, Cl. 174-153.00G.

Nasu, Shogo; and Saiki, Koji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Perpendicular magnetic storage medium. 4,797,330, Cl. 428-694.000.

National Gypsum Company: *See*—
Menchetti, Robert J., 4,796,396, Cl. 52-127.500.

National House Industrial Co., Ltd.: *See*—
Yoshida, Shigeo; Kitagawa, Satoshi; Harada, Shozo; Koide, Tetsuya; and Hasegawa, Manabu, 4,797,319, Cl. 428-312.400.

National Oilwell: *See*—
Cowan, William S.; and Galle, Edward M., Jr., 4,797,029, Cl. 405-170.000.

National Research Council of Canada: *See*—
Guiver, Michael D.; ApSimon, John W.; and Kutowy, Oleh, 4,797,457, Cl. 525-534.000.

National Research Development Corporation: *See*—
Wynne, Charles G., 4,796,984, Cl. 350-444.000.

National Semiconductor Corporation: *See*—
Hall, Christopher M., 4,797,652, Cl. 340-146.200.
Widlar, Robert J., 4,797,629, Cl. 330-258.000.

National Telephone Supply Co., The: *See*—
Meyers, Richard G., 4,796,338, Cl. 24-68.00R.

Nsudascher, Peter: *See*—
Martini, Norbert; and Naudascher, Peter, 4,796,879, Cl. 271-218.000.

Nava & Co. S.p.A.: *See*—
Nava, Pier L., 4,796,309, Cl. 2-414.000.

Nava, Pier L., to Nava & Co. S.p.A. Protective helmet retained on the rear of wearer's head. 4,796,309, Cl. 2-414.000.

Naville, Charles: *See*—
Laurent, Jean; Naville, Charles; and Paterna, Rene, 4,796,723, Cl. 181-102.000.

Naya, Kotaro: *See*—
Hayakawa, Tadashi; Shiinoki, Kazuaki; Mitsuhashi, Sinji; and Naya, Kotaro, 4,797,068, Cl. 417-201.000.

NCR Canada Ltd. - NCR Canada LTEE: *See*—
Brooks, Ralf M., 4,797,837, Cl. 364-519.000.

NCR Corporation: *See*—
Ferrante, Ronald A., 4,797,551, Cl. 250-234.000.
Nelson, Hilding E.; Brown, Jeffrey O.; and Zurn, Shayne M., 4,797,838, Cl. 364-551.010.
Nguyen, Chinh K.; and Flicek, Charles A., 4,797,817, Cl. 364-200.000.
Rohulich, John J.; and Keys, John B., 4,797,932, Cl. 381-104.000.

Neal, Kyle R. Welding electrode can opener. 4,796,361, Cl. 30-447.000.

NEC Corporation: *See*—
Asazawa, Hiroshi, 4,797,576, Cl. 307-272.100.
Furukawa, Yasuo; Yamazaki, Katsuyuki; Hosaka, Takemi; and Fukui, Akira, 4,797,931, Cl. 351-56.000.
Harasaki, Hidenobu; Tamitani, Ichiro; and Endo, Yukio, 4,797,740, Cl. 358-136.000.
Ishimoto, Shoji, 4,797,573, Cl. 307-269.000.
Kohmoto, Mitsuo; and Matsuo, Yohichi, 4,797,783, Cl. 361-384.000.
Nakazawa, Satoshi, 4,797,625, Cl. 328-133.000.
Tajima, Joji, 4,797,937, Cl. 382-1.000.
Tsuji, Akira; and Takai, Haruki, 4,797,678, Cl. 342-352.000.

Negi, Tahee: *See*—
Takeuchi, Keiji; Nishino, Takashi; Odera, Motoyasu; Shimogaki, Hisao; and Negi, Tahee, 4,797,362, Cl. 435-221.000.

Neiman, Ralph, to Penny-Ohlmann-Neiman, Inc. Hidden printing. 4,796,921, Cl. 283-91.000.

Nelson, Hilding E.; Brown, Jeffrey O.; and Zurn, Shayne M., to NCR Corporation. Procedure for evaluating the metastability characteristics of a synchronizing device. 4,797,838, Cl. 364-551.010.

Nelson Irrigation Corporation: *See*—
Davisson, Paul D., 4,796,811, Cl. 239-222.170.

Nelson, Michael G.; and Oblad, Hayward B., to Consolidation Coal Company. Fiber optic detector for flotation cell processing. 4,797,550, Cl. 250-227.000.

Nelson, Michael G.: *See*—
Oblad, Hayward B.; Nelson, Michael G.; and Sandbrook, Thomas D., 4,797,559, Cl. 250-227.000.

Nelson, Robert A.; and Altman, Carroll C., to Kwik-File, Inc. Apparatus for cutting wrapping paper. 4,796,792, Cl. 225-72.000.
Nelson, Roger E., to Sierracin Corporation. Apparatus and method for measuring conductance including a temperature controlled resonant tank circuit with shielding. 4,797,614, Cl. 324-236.000.
Nemoto, Ichiro; Aosaki, Ko; Misawa, Atsushi; and Otora, Takahito, to Seikosha Co., Ltd. Focal plane shutter. 4,797,699, Cl. 354-246.000.
Nestec S. A.: *See*—
DeWit, Johannes, 4,797,292, Cl. 426-285.000.
Neuman, Richard C., to B. F. Goodrich Company, The. Melt processable CPVC blends and alloys thereof. 4,797,442, Cl. 524-394.000.
Neumann, Eberhard W., to Krupp Polysius AG. Method and apparatus for utilizing the heat energy of domestic and commercial refuse. 4,797,091, Cl. 432-14.000.
Newman, David J.: *See*—
Bowie, Betty A.; Hedde, Richard D.; Lindsey, Thomas O.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,797,280, Cl. 424-118.000.
Newman, Robert C., Jr.: *See*—
Ference, Jonathan H.; Blonstein, Steven M.; Rowen, Michael J.; and Newman, Robert C., Jr., 4,797,599, Cl. 315-194.000.
Ng, Chai-Nam; and Dhyanchand, John J., to Sundstrand Corp. Multiple phase rectifier with active filter for removing noise in triggering signals and digital phase shift compensator for phase shifting signal passed through. 4,797,802, Cl. 363-87.000.
NGK Insulators, Ltd.: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,797,194, Cl. 204-425.000.
NGK Spark Plug Co., Ltd.: *See*—
Akao, Shigeaki; Kawamura, Mitsuyoshi; and Kojima, Takio, 4,796,517, Cl. 92-187.000.
Matsuura, Tooru; Ishida, Noboru; and Kawamura, Mitsuyoshi, 4,796,576, Cl. 123-90.430.
Nguyen, Chinh K.; and Flicek, Charles A., to NCR Corporation. Single cycle store operations in a virtual memory. 4,797,817, Cl. 364-200.000.
Nguyen, Tuan A., to Ball Corporation. Metal closure with circumferentially-variegated strengthening. 4,796,772, Cl. 220-66.000.
Nguyen, Van T.; Chateignon, Claude; and Deschamps, Georges, to Bendix Electronics S.A. Bidirectional interface circuit having a unipolar port and a bipolar port for logic signals. 4,797,582, Cl. 307-475.000.
Nice, Jeffrey D. Apparatus for facilitating liquid transfer from a drum. 4,796,677, Cl. 141-88.000.
Nichelson, William; Groff, Gordon H.; and Jones, Paul C., to Brandt, Incorporated. Document handling counting apparatus. 4,796,878, Cl. 271-10.000.
Nicholls, Alison W.: *See*—
Ardley, John H.; Smith, Brett A.; and Nicholls, Alison W., 4,797,301, Cl. 427-8.000.
Nicolich, Patrick, to FAG Kugelfischer Georg Schafer (KGaA). High-speed anti-friction bearing particularly for airplane power plants. 4,797,014, Cl. 384-490.000.
Nicor, Inc.: *See*—
Cook, Jeffrey A., 4,797,509, Cl. 174-84.00C.
Nielsen, Elgard: *See*—
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Nielsen, Per G.; Nielsen, Elgard; and Nygaard, Steen, to V. Kann Rasmussen Industri A/S. Window sash with frame and operating handle. 4,796,933, Cl. 292-265.000.
Nifco Inc.: *See*—
Kong, Alan, 4,796,732, Cl. 188-282.000.
Nakayama, Hiromichi, 4,796,733, Cl. 188-291.000.
Nihon Radiator Co., Ltd.: *See*—
Ikuta, Shiro; Suyama, Eizo; Yokoyama, Masaru; and Yoshimura, Takeshi, 4,796,694, Cl. 165-152.000.
Niikawa, Ryo: *See*—
Kawasaki, Yoshinobu; Niikawa, Ryo; and Ikeda, Yuzi, 4,796,346, Cl. 29-700.000.
Nikolaus Sorg GmbH & Co. Kg: *See*—
Pieper, Helmut, 4,797,092, Cl. 432-95.000.
Nimmersjo, Gunnar, to Asea Aktiebolag. Fault location in a power supply network. 4,797,805, Cl. 364-481.000.
Nippon Air Brake Co., Ltd.: *See*—
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Nippon Carbide Koyo Kabushiki Kaisha: *See*—
Maruyama, Masatoshi; Hasegawa, Yukinobu; and Tange, Toyokichi, 4,797,339, Cl. 430-109.000.
Nippon Colin Co., Ltd.: *See*—
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Nippon Mining Co., Ltd.: *See*—
Lach, Lawrence E.; and Ohoka, Mikiharu, 4,797,565, Cl. 307-450.000.
Nippon Steel Corporation: *See*—
Nakayama, Hisanobu; Nakashima, Shouzaburo; Shimoyama, Yoshiaki; and Mori, Yasukazu, 4,797,167, Cl. 148-111.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, 4,797,143, Cl. 65-3.120.
Nippon Thompson Co., Ltd.: *See*—
Tanaka, Kazuhiko, 4,797,012, Cl. 384-45.000.
Nippon Thomson Co., Ltd.: *See*—
Hidano, Kengo; and Amano, Susumu, 4,797,015, Cl. 384-580.000.
Nippon Zeon Co., Ltd.: *See*—
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Nippon Zeon Company, Ltd: *See*—
Hata, Kotaro, 4,797,324, Cl. 428-411.100.
Nippondenso Co., Ltd.: *See*—
Goto, Hiroyuki; Kohama, Tokio; Nishio, Yoshitaka; Obayashi, Hideki; and Horie, Kazuyuki, 4,796,584, Cl. 123-403.000.
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Onogi, Nobuyoshi; Shimamoto, Mamoru; and Shinoda, Yoshio, 4,797,826, Cl. 364-426.040.
Wakata, Hideo; Imoto, Yuzo; Takei, Toshihiro; and Hattori, Yoshiyuki, 4,796,957, Cl. 303-116.000.
Nishiguchi, Masayuki; and Akagiri, Kenzo, to Sony Corporation. Digital signal transmission device. 4,797,902, Cl. 375-27.000.
Nishiguchi, Yasuo: *See*—
Tajiri, Hiromitsu; Nishiguchi, Yasuo; and Matsuyama, Chiaki, 4,797,561, Cl. 250-578.000.
Nishimukai, Tadahiko: *See*—
Uchiyama, Kunio; and Nishimukai, Tadahiko, 4,797,816, Cl. 364-200.000.
Nishimura, Tadashi; and Akasaka, Yoichi, to Mitsubishi Denki, K.K. Stacked semiconductor device. 4,797,723, Cl. 357-40.000.
Nishimura, Yukinobu: *See*—
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,796,588, Cl. 123-479.000.
Nishimura, Yukuo; Haruta, Masahiro; Hirai, Yutaka; Sakai, Kunihiro; and Matsuda, Hiroshi, to Canon Kabushiki Kaisha. Optical element for modulation of light by heating a monomolecular film. 4,796,981, Cl. 350-353.000.
Nishino, Takashi: *See*—
Takeuchi, Keiji; Nishino, Takashi; Odera, Motoyasu; Shimogaki, Hisao; and Negi, Tahee, 4,797,362, Cl. 435-221.000.
Nishio, Yoshitaka: *See*—
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Nishioka, Nobuaki, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a high-voltage unit malfunction detecting function. 4,797,705, Cl. 355-14.0CH.
Nishiyama, Toshimichi: *See*—
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Nissan Motor Co., Ltd.: *See*—
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Kurami, Kunihiko; and Akutagawa, Kiyoshi, 4,797,835, Cl. 364-513.000.
Kuroki, Junsuke; Takahashi, Tohru; and Ito, Ken, 4,796,911, Cl. 280-689.000.
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Nisshin Steel Co., Ltd.: *See*—
Nakako, Takefumi; Inoue, Shoji; and Takezoe, Akinobu, 4,796,797, Cl. 228-144.000.
Nitecki, Danute E.; and Moreland, Margaret, to Cetus Corporation. Compound 1-(3-(2-pyridyldithio)propionamido)-12-(5-hydrazidoglutaramido)-4,9-dioxadodecane. 4,797,491, Cl. 546-291.000.
Nittan Company, Limited: *See*—
Kimura, Tatsuo, 4,797,664, Cl. 340-693.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Nakamura, Tomio; Kikuchi, Katsuaki; and Inagaki, Takeshi, 4,797,184, Cl. 204-59.00R.
Nitto Electric Industrial Co., Ltd.: *See*—
Sakuramoto, Takahumi; Asoshina, Eishi; Tominaga, Takashi; Ijichi, Ichiro; Kamei, Kiyohiro; and Konishi, Toshiharu, 4,797,251, Cl. 419-9.000.
Niwayama, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Thyristor with aligned trigger guide. 4,797,727, Cl. 357-79.000.
Nobutani, Toshiyuki, to Canon Kabushiki Kaisha. Disk cramp apparatus. 4,797,873, Cl. 369-270.000.
Nodama, Takashi: *See*—
Hamada, Takashi; Hino, Teruyuki; Nodama, Takashi; and Matsuoka, Hiroshi, 4,796,842, Cl. 248-186.000.
Nodelman, Neil H., to Mobay Corporation. Diepoxide reacted with a half ester from a dicarboxyic acid anhydride and polyalkylene glycol. 4,797,464, Cl. 528-110.000.
Nogami, Mari: *See*—
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Noguchi, Masahiko: *See*—
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Nolte, Frank, to Lemforder Metallwaren AG. Height-adjustable steering column for motor vehicles. 4,796,481, Cl. 74-493.000.
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Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.

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Norden, Howard P., Jr. Door locking mechanism. 4,796,445, Cl. 70-94.000.
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Nordischer Maschinenbau Rud. Baader GmbH + Co: *See*—
Mette, Manfred, 4,796,523, Cl. 99-470.000.
Norfab A/S: *See*—
Overgaard, Arvid, 4,796,544, Cl. 110-196.000.
Norimatsu, Kohji: *See*—
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North American Industries, Inc.: *See*—
Vaello, Donald B., 4,797,914, Cl. 379-96.000.
Northern Telecom Limited: *See*—
Beaulieu, Laurence A. J.; and Cristescu, Alex G., 4,797,124, Cl. 439-719.000.
Berger, Jean P.; Pridgen, Evans H.; and Owens, Alfred W., 4,796,560, Cl. 118-211.000.
Sunter, Stephen K., 4,797,580, Cl. 307-451.000.
Northland Aluminum Products, Inc.: *See*—
Dalquist, H. David; Jorgensen, Jorgen A.; Keleny, Lloyd G.; Nygren, Donald W.; and Taylor, John N., 4,796,776, Cl. 220-203.000.
Norton Company: *See*—
Bauer, Ralph, 4,797,139, Cl. 51-293.000.
Bauer, Ralph; and Franklin, Rufus M., 4,797,269, Cl. 423-600.000.
Noske, Erich: *See*—
Heumann, Reiner; Noske, Erich; and Rattner, Manfred, 4,796,613, Cl. 128-24.00A.
Nottingham, John R.: *See*—
Spirk, John W.; Nottingham, John R.; and Kalman, Jeffrey M., 4,796,784, Cl. 222-80.000.
Nova Technologies Inc.: *See*—
DiMatteo, Paul; Chubb, Charles F.; and Senator, Stewart, 4,796,313, Cl. 5-81.00R.
Novibra GmbH: *See*—
Braxmeier, Hans, 4,796,419, Cl. 57-134.000.
Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Collapsible inhalation valve. 4,796,614, Cl. 128-200.140.
Nozaki, Ken; and Akai, Yuichi, to Agency of Industrial Science and Technology; and Ebara Corporation. Energy storing apparatus. 4,797,566, Cl. 307-43.000.
Nukushina, Masanori, to Juki Corporation. Method and apparatus for preparing sewing data. 4,796,551, Cl. 112-266.100.
Numata, Mitsuo: *See*—
Miyake, Akio; Yoshimura, Yoshinobu; and Numata, Mitsuo, 4,797,395, Cl. 514-206.000.
Numata, Toshi: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.
Nunlist, Erwin J., to Pfaudler Companies, Inc., The. Method for avoiding thermal stresses in glass lined vessels. 4,796,344, Cl. 29-157.00R.
Nygaard, Steen: *See*—
Nielsen, Per G.; Nielsen, Elgard; and Nygaard, Steen, 4,796,933, Cl. 292-265.000.
Nygren, Donald W.: *See*—
Dalquist, H. David; Jorgensen, Jorgen A.; Keleny, Lloyd G.; Nygren, Donald W.; and Taylor, John N., 4,796,776, Cl. 220-203.000.
Nyiredy, Szabolcs; Erdelmeier, Clemens; and Sticher, Otto, to Petazon, Inc. Method for sequential centrifugal stratification chromatography for separating components from mixtures. 4,797,215, Cl. 210-658.000.
Oana, Yoshinori: *See*—
Fukuma, Yasufumi; Oana, Yoshinori; and Arai, Akihiro, 4,796,989, Cl. 351-212.000.
Obadia, Jacques, to RICAL S.A. Tamper-proof pourer and stopper cap assembly. 4,796,769, Cl. 215-232.000.
Obayashi, Hideki: *See*—
Goto, Hiroyuki; Kohama, Tokio; Nishio, Yoshitaka; Obayashi, Hideki; and Horie, Kazuyuki, 4,796,584, Cl. 123-403.000.
Obayashi, Hiroaki: *See*—
Kobayashi, Hiroshi; and Obayashi, Hiroaki, 4,796,726, Cl. 181-123.000.
Obeng, Edward D. A.: *See*—
van Lookeren-Campagne, Constant J.; and Obeng, Edward D. A., 4,797,366, Cl. 435-264.000.
Oblad, Hayward B.; Nelson, Michael G.; and Sandbrook, Thomas D., to Consolidation Coal Company. Method and apparatus for controlling a flotation cell. 4,797,559, Cl. 250-227.000.
Oblad, Hayward B.: *See*—
Nelson, Michael G.; and Oblad, Hayward B., 4,797,550, Cl. 250-227.000.
Obrecht, Gerard: *See*—
Dufour, Maurice; and Obrecht, Gerard, 4,796,988, Cl. 351-169.000.
Ochi, Hisayuki: *See*—
Nakahara, Toshiaki; Ohsaki, Ichiro; Ushiyama, Hisayuki; Kiuchi, Masashi; Yamazaki, Masuo; Goseki, Yasuhide; and Ochi, Hisayuki, 4,797,344, Cl. 430-138.000.
Ochmann, Rudolf; and Zimmermann, Robert H., to U.S. Philips Corporation. X-ray generator incorporating dose rate control. 4,797,905, Cl. 378-108.000.
O'Connor, Chadwell. Cable tripod spreader. 4,796,843, Cl. 248-168.000.
Octel Communications Corp.: *See*—
Kousa, Paavo T., 4,797,672, Cl. 340-825.300.
Ocvirk, Norbert: *See*—
Seibert, Wolfram; Ocvirk, Norbert; Trach, Guenther; and Maas, Joachim, 4,796,959, Cl. 303-119.000.
Odawara Industry Co., Ltd.: *See*—
Odawara, Kunimitsu, 4,796,422, Cl. 57-299.000.
Odawara, Kunimitsu, to Odawara Industry Co., Ltd. Apparatus for treating tail yarn in textile spindle assembly. 4,796,422, Cl. 57-299.000.
Odenberg, Richard: *See*—
Honorof, Frank D.; and Odenberg, Richard, 4,797,773, Cl. 361-58.000.
Odera, Motoyasu: *See*—
Takeuchi, Keiji; Nishino, Takashi; Odera, Motoyasu; Shimogaki, Hisao; and Negi, Tahee, 4,797,362, Cl. 435-221.000.
ODL, Incorporated: *See*—
Mulder, Lawrence, 4,796,400, Cl. 52-200.000.
Oen, Joshua T., to Paccar, Inc. Forward light housing assembly. 4,797,792, Cl. 362-83.000.
Ogawa, Kazuo: *See*—
Fujii, Setsuro; Ogawa, Kazuo; Hamakawa, Toshihiro; and Muranaka, Yoshiyuki, 4,797,502, Cl. 558-52.000.
Ogawa, Kyosuke: *See*—
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,299, Cl. 430-65.000.
Honda, Mitsuru; Sueda, Tetsuo; Murai, Keiichi; and Ogawa, Kyosuke, 4,797,327, Cl. 428-600.000.
Honda, Mitsuru; Koike, Atsushi; Ogawa, Kyosuke; and Murai, Keiichi, 4,797,336, Cl. 430-57.000.
Ogawa, Tadashi: *See*—
Takahashi, Osamu; Ogawa, Tadashi; Sakai, Minoru; and Toriuchi, Masaharu, 4,797,349, Cl. 430-372.000.
Ogawa, Tetsuya: *See*—
Goto, Yasuyuki; Sugimori, Shigeru; and Ogawa, Tetsuya, 4,797,228, Cl. 252-299.630.
Ogawa, Tomoya: *See*—
Yoshimura, Shoji; Tani, Yoichiro; Matsuzaki, Youzi; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,797,477, Cl. 536-18.500.
Ohashi, Keiichi, to Skylite Industry Co., Ltd. Switch device of portable flashlight. 4,797,517, Cl. 200-60.000.
Ohbayashi, Keiji; Chino, Shigeo; Okumura, Mitsuhiro; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Process for forming dye-image using a developer comprising an image stabilizer, a hydroxylamine and not containing benzyl alcohol. 4,797,350, Cl. 430-380.000.
Ohkoba, Akira: *See*—
Inoue, Tadashi; Ohkoba, Akira; Sakashita, Kunio; Utsunomiya, Akira; Shinozaki, Takeki; and Ieda, Minoru, 4,797,265, Cl. 423-320.000.
Ohman, Carl G., to Aktiebolaget Electrolux. Position sensing system for a moving object wherein a lens focuses light onto a radiation sensitive matrix. 4,797,557, Cl. 250-561.000.
Ohmi, Fumiya: *See*—
Watada, Atsuyuki; and Ohmi, Fumiya, 4,797,331, Cl. 428-694.000.
Ohnemueller, Hans: *See*—
Leiber, Heinz; Ohnemueller, Hans; and Kastner, Klaus, 4,796,717, Cl. 180-197.000.
Ohno, Kenichi: *See*—
Kubo, Kanji; and Ohno, Kenichi, 4,796,904, Cl. 280-91.000.
Oho, Shigeru: *See*—
Sonobe, Hisao; Makino, Junichi; Oho, Shigeru; Matsumoto, Masahiro; Kitano, Kouji; and Araki, Hiroshi, 4,796,993, Cl. 356-350.000.
Ohoka, Mikiharu: *See*—
Lach, Lawrence E.; and Ohoka, Mikiharu, 4,797,565, Cl. 307-450.000.
Ohsaki, Ichiro: *See*—
Nakahara, Toshiaki; Ohsaki, Ichiro; Ushiyama, Hisayuki; Kiuchi, Masashi; Yamazaki, Masuo; Goseki, Yasuhide; and Ochi, Hisayuki, 4,797,344, Cl. 430-138.000.
Ohshima, Shigeru, to Canon Kabushiki Kaisha. Pickup apparatus. 4,797,734, Cl. 358-55.000.
Ohta, Masahiro: *See*—
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.
Ohta, Takeshi; Kamiya, Yoji; Nakashima, Kunimichi; and Taniguchi, Mitsuyoshi, to Toyoda Koki Kabushiki Kaisha. Pallet exchange apparatus. 4,797,052, Cl. 414-744.300.
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, to Kanebo, Ltd. Piperazine compounds and anti-ulcer composition containing the same. 4,797,400, Cl. 514-255.000.
Ohtomo, Toshio: *See*—
Sasaki, Migaku; Koike, Eiji; Ohtomo, Toshio; and Hirose, Jun, 4,796,605, Cl. 600-22.000.
Ohtsuki, Tomonari: *See*—
Kuboi, Sadao; and Ohtsuki, Tomonari, 4,797,122, Cl. 439-589.000.
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. High-temperature adhesive polyimide from 2,6-bis(3-aminophenoxy)pyridine. 4,797,466, Cl. 528-185.000.

Oikawa, Katsuya; Egami, Hidemi; Saitor, Katuo; and Satomura, Hiroshi, to Canon Kabushiki Kaisha. Illumination apparatus. 4,797,598, Cl. 315-85.000.

Oikawa, Toshihiro: *See*—
Fujii, Noriaki; Iwata, Takeshi; and Oikawa, Toshihiro, 4,796,574, Cl. 123-90.230.

Oilgear Towler, Inc.: *See*—
Hall, Richard W., 4,796,428, Cl. 60-413.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette with spring biased U-shaped pivotable guard panel. 4,797,768, Cl. 360-132.000.

Oka, Mitsunori: *See*—
Sugano, Mitugu; Kaneko, Shinichi; Oka, Mitsunori; Nokina, Kimiya; and Koshimizu, Kazuhiro, 4,797,754, Cl. 360-48.000.

Okada, Yasushi: *See*—
Nakajima, Toyohei; and Okada, Yasushi, 4,796,587, Cl. 123-440.000.

Okamoto, Masanori; Uchida, Itsuo; Umehara, Kazuyoshi; Kohsaka, Masanobu; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Furanone derivatives, process for preparation thereof and use thereof. 4,797,417, Cl. 514-473.000.

Okamura, Katutoshi: *See*—
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, 4,797,358, Cl. 435-176.000.

Okamura, Noboru: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.

Okamura, Yuuichi, to Kabushikigaisha Tokyo Kikai Seisakusho. Ink supplying apparatus. 4,796,549, Cl. 101-350.000.

Okawa, Masaru: *See*—
Aizawa, Tadashi; Nishiyama, Toshimichi; Okawa, Masaru; and Nakane, Kazuo, 4,797,169, Cl. 156-64.000.

Okazaki, Masaki: *See*—
Inagaki, Yoshio; and Okazaki, Masaki, 4,797,476, Cl. 534-727.000.

Okazaki, Toshio: *See*—
Kumagai, Fumio; and Okazaki, Toshio, 4,797,512, Cl. 174-135.000.
Ono, Mamoru; Naruse, Kohji; and Okazaki, Toshio, 4,797,513, Cl. 174-153.00G.

Okouchi, Satoshi, to Kabushiki Kaisha Toshiba. Wire dot matrix printer capable of printing letters on a plurality of superposed sheets of paper. 4,797,017, Cl. 400-59.000.

Okubo, Akira; and Sasaki, Kenichi, to Murata Manufacturing Co., Ltd. Inductor and a manufacturing method therefor. 4,797,647, Cl. 336-175.000.

Okubo, Yasuo; and Hirasawa, Masataka, to Kabushiki Kaisha Toshiba. Synchronizing circuit. 4,797,574, Cl. 307-269.000.

Okuda, Hiroshi: *See*—
Kimura, Masatoshi; Okuda, Hiroshi; Fujikawa, Yujiro; and Inomata, Tatsuaki, 4,796,411, Cl. 53-453.000.

Okumura, Hiroyuki: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; Okumura, Hiroyuki; and Nakaguchi, Osamu, 4,797,399, Cl. 514-253.000.

Okumura, Mitsuhiro: *See*—
Ohbayashi, Keiji; Chino, Shigeo; Okumura, Mitsuhiro; and Onodera, Kaoru, 4,797,350, Cl. 430-380.000.

Olausson, Lars: *See*—
Herstad, Ola; and Olausson, Lars, 4,796,546, Cl. 110-216.000.

Olin Corporation: *See*—
Lewis, Brian G.; and Yarwood, John C., 4,796,687, Cl. 164-455.000.

Olin Hunt Specialty Products, Inc.: *See*—
Bujese, David P., 4,797,714, Cl. 355-77.000.
Jeffries, Alfred T., III, 4,797,345, Cl. 430-165.000.

Oliver, Dell B.; and Jahoda, Peter, to Gila River Products, Inc. Solar control window film. 4,797,317, Cl. 428-204.000.

Ollivier, Jean; and Barthomeuf, Jean-Paul, to Societe de Prospection et D'Inventions Techniques (S.P.I.T.). Fastening unit with nail anchorage. 4,797,046, Cl. 411-448.000.

Olsen, Arthur M.: *See*—
McGowan, David L., III; Olsen, Arthur M.; and Oxenberg, Steven M., 4,797,669, Cl. 340-870.400.

Olshansky, Kenneth: *See*—
Paul, Patrick R. D.; Price, James H.; and Olshansky, Kenneth, 4,796,948, Cl. 297-284.000.

Olympus Optical Co., Ltd.: *See*—
Kawashima, Masahiro, 4,796,604, Cl. 128-6.000.
Rokutan, Takao, 4,797,872, Cl. 369-109.000.
Yazawa, Nobuyoshi, 4,797,737, Cl. 358-98.000.
Yoshikawa, Shoji, 4,797,866, Cl. 369-43.000.

Omaha Cold Storage Terminals, Inc.: *See*—
Mattson, Glenn H., 4,796,435, Cl. 62-63.000.

Omaki, Takanobu: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,797,702, Cl. 354-413.000.

Omni Holding Company: *See*—
Dombrowski, Anthony E., 4,797,673, Cl. 340-904.000.

Omron Tateisi Electronics Co.: *See*—
Kimizu, Ryuichi, 4,797,540, Cl. 235-383.000.

Onanian, Richard A. Optical wave guide light collector for microscope. 4,796,985, Cl. 350-523.000.

Ondrus, Joseph F.: *See*—
Rutter, Harold T.; and Ondrus, Joseph F., 4,796,363, Cl. 33-164.00R.

O'Neill, Ronan R., to W. R. Grace & Co. Method of packaging utilizing a taped bag chain with cassette. 4,796,412, Cl. 53-473.000.

Ono, Mamoru; Naruse, Kohji; and Okazaki, Toshio, to Yazaki Corporation. Grommet with wires sealed thereto and method of forming same. 4,797,513, Cl. 174-153.00G.

Ono, Nobutaka, to Osaka Bobbin Kabushiki Kaisha. Method of dyeing and hydro-extracting collectively yarn cheeses and apparatus therefor. 4,796,320, Cl. 8-155.200.

Ono, Satoshi: *See*—
Hiramitsu, Tetsushi; Ono, Satoshi; Hirano, Atsuo; and Murase, Zenzaburo, 4,796,482, Cl. 74-492.000.

Ono, Yuichi; and Takikawa, Kazunori, to Usui Kokusai Sangyo Kabushiki Kaisha. Thermal response type fluid fan coupling device. 4,796,571, Cl. 123-41.120.

Ono, Yuichi: *See*—
Uomi, Kazuhisa; Yoshizawa, Misuzu; Ono, Yuichi; Chinone, Naoki; and Kajimura, Takashi, 4,797,891, Cl. 372-46.000.

Onodera, Kaoru: *See*—
Ohbayashi, Keiji; Chino, Shigeo; Okumura, Mitsuhiro; and Onodera, Kaoru, 4,797,350, Cl. 430-380.000.

Onodera, Noriaki: *See*—
Inaba, Fumio; Ito, Hiromasa; Onodera, Noriaki; and Mizuyoshi, Akira, 4,797,890, Cl. 372-46.000.

Onodera, Takashi: *See*—
Matsui, Shigeru; Onodera, Takashi; Sekihara, Kensuke; Shiono, Hidemi; and Kohno, Hideki, 4,797,616, Cl. 324-309.000.

Onogi, Nobuyoshi; Shimamoto, Mamoru; and Shinoda, Yoshio, to Nippondenso Co., Ltd. Speed control system for vehicles. 4,797,826, Cl. 364-426.040.

Ooi, Yoshikatsu: *See*—
Kotani, Matahira; Hayashi, Motohiko; and Ooi, Yoshikatsu, 4,797,748, Cl. 358-257.000.

Oowa, Nobutaka: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,797,823, Cl. 364-424.050.

Oprach, Klaus; Harms, Luhr; Braun, Gebhard; and Trolltsch, Karl, to Braun Aktiengesellschaft. Electric shaving apparatus with a pivoted shearing head system. 4,796,359, Cl. 30-43.920.

Oregon Graduate Center: *See*—
DeFreeze, Richard K.; Elliott, Richard A.; and Puretz, Joseph, 4,797,892, Cl. 372-50.000.

Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, to Hitachi, Ltd. Distributed processing system and method. 4,797,885, Cl. 371-19.000.

Orndal, Carl-Henry; Gummesson, Bengt-Ake G.; and Ericson, Bjorn-Inge, to Gambro AB. Detector system for monitoring a fluid containing tube. 4,797,655, Cl. 340-521.000.

Orsino, Paul: *See*—
Sevier, David C., 4,797,214, Cl. 210-651.000.

Osaka Bobbin Kabushiki Kaisha: *See*—
Ono, Nobutaka, 4,796,320, Cl. 8-155.200.

Osaki, Katsumichi: *See*—
Motai, Hiroshi; Fukushima, Yaichi; Osaki, Katsumichi; Okamura, Katutoshi; and Imai, Kazutaka, 4,797,358, Cl. 435-176.000.

Osawa, Izumi: *See*—
Iino, Syuji; Hotomi, Hideo; Saeki, Noboru; Fujiwara, Masanori; Uchino, Fumiko; and Osawa, Izumi, 4,797,338, Cl. 430-58.000.

Osbourn, Gordon C.: *See*—
Chaffin, Roger J., deceased; Dawson, Ralph; Fritz, Ian J.; Osbourn, Gordon C.; and Zipperian, Thomas E., 4,797,716, Cl. 357-22.000.

Osterhuber, Edward J., to Exxon Research and Engineering Company. Upgrading heavy oils by solvent dissolution and ultrafiltration. 4,797,200, Cl. 208-308.000.

Ostoich, Vladimir E.: *See*—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,797,283, Cl. 424-443.000.

O'Sullivan, Mark H. Processing of sugar cane product and dried product obtained therefrom. 4,797,297, Cl. 426-483.000.

Otis Engineering Corporation: *See*—
Gano, John C., 4,796,698, Cl. 166-135.000.

Oto, Duane H.: *See*—
Lee, Winston K. M.; Oto, Duane H.; and Tam, Simon M., 4,797,856, Cl. 365-185.000.

Otora, Takahito: *See*—
Nemoto, Ichiro; Aosaki, Ko; Misawa, Atsushi; and Otora, Takahito, 4,797,699, Cl. 354-246.000.

Otsap, Ben A.: *See*—
Phillips, Robert E.; and Otsap, Ben A., 4,796,656, Cl. 137-106.000.

Ott, William M., to Silor Optical of Florida, Inc. Optical lens carrier. 4,796,756, Cl. 206-454.000.

Otto, Gerhard; Rohrbach, Manfred; and Leupold, Gerald, to C. Behrens AG. Cutting press. 4,797,531, Cl. 219-121.670.

Otto, Herbert J.: *See*—
Austin, Richard L.; Otto, Herbert J.; and Jones, Frank L., 4,797,619, Cl. 324-409.000.

Otto, Klaus: *See*—
Moser, Thomas; Otto, Klaus; Kippenberg, Horst; Ramler, Johann; and Unterlass, Josef, 4,797,780, Cl. 361-321.000.

Ovaska, Seppo, to Elevator GmbH. Procedure for counting moving objects as they stop. 4,797,675, Cl. 342-28.000.

Overgaard, Arvid, to Norfab A/S. Apparatus for tearing up and stoking bales of straw material and for stoking other kinds of solid fuel. 4,796,544, Cl. 110-196.000.

Owen, Dave L.; and Jahn, Robert E., to W. R. Grace & Co.-Conn. Film folding device. 4,796,405, Cl. 53-222.000.

Owens, Alfred W.: *See—*
Berger, Jean P.; Pridgen, Evans H.; and Owens, Alfred W., 4,796,560, Cl. 118-211.000.
Oxenberg, Steven M.: *See—*
McGowan, David L., III; Olsen, Arthur M.; and Oxenberg, Steven M., 4,797,669, Cl. 340-870.400.
Oxley, Donald W.: *See—*
McEntee, Timothy J.; Bloemer, Robert W.; Oxley, Donald W.; and Thatte, Satish M., 4,797,810, Cl. 364-200.000.
Oza, Rajshekhar D., to General Motors Corporation. Monolithic catalytic converter with improved gas distribution. 4,797,263, Cl. 422-176.000.
Ozaki, Thomas, to GTE Communication Systems Corporation. Process for making close tolerance thick film resistors. 4,796,356, Cl. 29-620.000.
Ozawa, Takashi, to Fuji Xerox Co., Ltd. Contact type image sensor. 4,797,571, Cl. 307-311.000.
Ozeki, Katsuhisa: *See—*
Saitou, Mitsuo; Urabe, Shigeharu; and Ozeki, Katsuhisa, 4,797,354, Cl. 430-567.000.
Pac-Tec, Inc.: *See—*
Forrer, Douglas S., 4,797,024, Cl. 404-16.000.
Paccar, Inc.: *See—*
Oen, Joshua T., 4,797,792, Cl. 362-83.000.
Paetsch, Lawrence M.: *See—*
Patel, Pinakin S.; and Paetsch, Lawrence M., 4,797,379, Cl. 502-101.000.
Pajala, Jari, to Paloheimo Oy. Step silencing parquet floor. 4,796,402, Cl. 52-390.000.
Palanisamy, Ponnusamy, to Delco Electronics Corporation. Moisture sensor and method of fabrication thereof. 4,797,605, Cl. 324-65.00R.
Pall Corporation: *See—*
Matkovich, Vlado I.; Martin, Jerold; and Degen, Peter J., 4,797,259, Cl. 422-101.000.
Palmer, John M.: *See—*
Voorhis, Roger J.; and Palmer, John M., 4,796,436, Cl. 62-77.000.
Paloheimo Oy: *See—*
Pajala, Jari, 4,796,402, Cl. 52-390.000.
Pan, Kee C.: *See—*
Tyan, Yuan S.; Pan, Kee C.; and Vazan, Fridrich, 4,797,871, Cl. 369-100.000.
Panahpour, Yousef. Massaging device. 4,796,616, Cl. 128-57.000.
Panamas, P. T.: *See—*
Pao, Liem T.; Yuen, Yeong H.; and Wu, Dan T., 4,796,821, Cl. 241-101.200.
Pao, Liem T.; Yuen, Yeong H.; and Wu, Dan T., to Panamas, P. T. Cutting apparatus for living plant materials. 4,796,821, Cl. 241-101.200.
Pappas, Greg. Shutter control apparatus. 4,797,567, Cl. 307-66.000.
Paradyne Corporation: *See—*
Armstrong, Thomas, 4,797,878, Cl. 370-96.000.
Moore, Wayne T., 4,797,815, Cl. 364-200.000.
Parco Mast and Substructures, Inc.: *See—*
Reed, Lowell M., 4,796,863, Cl. 254-337.000.
Parisius, John W.; and Sun, Anthony M. Separation of Islets of Langerhans. 4,797,213, Cl. 210-651.000.
Park, Roy, to Gullick Dobson Limited. Mine roof supports. 4,797,023, Cl. 405-291.000.
Parker, Dennis W.; and Lakin, David F., to Dowty Hydraulic Units Limited. Fluid control devices. 4,796,655, Cl. 137-83.000.
Parker, James E., to V-Tech, Inc. Antibody testing system. 4,797,260, Cl. 422-101.000.
Parr, William J.; and Hope, Peter, to Akzo N.V. Dichloro (acetic or propionic) acid aryl ester flame retardants. 4,797,441, Cl. 524-288.000.
Pasco Corporation: *See—*
Soma, Koroku; Watanabe, Noritsugu; and Taniguro, Wataru, 4,796,998, Cl. 356-376.000.
Pasetti, Mauro; and Siligoni, Marco, to SGS Microelettronica SpA. Monolithically integratable telephone circuit for supplying ringing signals to a subscriber's telephone line and for detecting an off the hook condition during ringing. 4,797,917, Cl. 379-253.000.
Paszko, Robert M.: *See—*
Kesel, Thomas A.; and Paszko, Robert M., 4,796,934, Cl. 292-336.300.
Patel, Pinakin S.; and Paetsch, Lawrence M., to Energy Research Corporation. Electrode structure and method of making same. 4,797,379, Cl. 502-101.000.
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Patrick, John L.: *See—*
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Patrick, Michael W.: *See—*
Bellay, Jeffrey D.; McDonough, Kevin C.; and Patrick, Michael W., 4,797,808, Cl. 364-200.000.
Patroni, Joseph J.; and Brandon, Malcolm R., to Bunge (Australia) Pty. Ltd. Solubilization of protein aggregates. 4,797,474, Cl. 530-351.000.
Patton Electric Company, Inc.: *See—*
Kaplanis, Kostas, 4,797,772, Cl. 361-42.000.
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Paul, Patrick R. D.; Price, James H.; and Olshansky, Kenneth. Patient support system for wheelchairs and the like. 4,796,948, Cl. 297-284.000.
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Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.
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Paulsen, Dean R., to General Scanning, Inc. Scanning system with tunable resonant actuator. 4,797,749, Cl. 358-302.000.
Paulson, Ralph E. Dental floss dispenser. 4,796,783, Cl. 222-80.000.
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Peck, Robert L., to T and G. Corporation. Ionic semiconductor materials and applications thereof. 4,797,190, Cl. 204-296.000.
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East, Gregory M., 4,796,738, Cl. 192-20.000.
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Peppel, George W., to Lockheed Corporation. Winch compensator. 4,796,862, Cl. 254-277.000.
Pereira, Anthony S. Automotive adjustable head & neck rest. 4,796,953, Cl. 297-400.000.
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Perkin-Elmer Corporation, The: *See—*
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Perkins, Robert L., to General Motors Corporation. Self adjusting seal for high pressure supply line. 4,796,895, Cl. 277-4.000.
Petak, Kevin R.; Soliman, Mohamed Y.; and Anderson, Merlin F., to Halliburton Company. Method of analyzing naturally fractured reservoirs. 4,797,821, Cl. 364-422.000.
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Peters, Rex B., to Sundstrand Data Control, Inc. Apparatus and method for determining the position of a tool in a borehole. 4,797,822, Cl. 364-422.000.
Petersen, Kurt. Laminated fabric coated plastic material. 4,797,253, Cl. 428-196.000.
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Scherubel, Gary A., 4,796,702, Cl. 166-308.000.
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Pfaudler Companies, Inc., The: *See—*
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Pfeiffer-Meshaw, Barbara A.: *See*—
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Brennan, Thomas M.; and Hendrick, Michael E., 4,797,298, Cl. 426-548.000.
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Glazer, Edward A.; and McFarland, James W., 4,797,486, Cl. 544-250.000.
Kemp, John E. G.; and Cross, Peter E., 4,797,401, Cl. 514-255.000.
Lowe, John A., III, 4,797,403, Cl. 514-259.000.
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Arfors, Karl E., 4,797,277, Cl. 424-85.800.
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Hampton, Joe B., 4,797,199, Cl. 208-262.100.
Liang, Yeon F., 4,797,448, Cl. 525-106.000.
Phillips, Robert E.; and Otaap, Ben A. Method and apparatus for causing a series of mechanical actions. 4,796,656, Cl. 137-106.000.
Phoenix Aktiengelsellschaft: *See*—
Glang, Siegfried, 4,797,032, Cl. 405-152.000.
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Pickard, George L.: *See*—
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Pickelhaupt, Alexander J.: *See*—
Sturdevan, Ronald P.; and Pickelhaupt, Alexander J., 4,797,115, Cl. 439-125.000.
Pickelman, Dale M.: *See*—
Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,797,187, Cl. 204-180.200.
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Misic, George J.; Lillo, Aarne; Patrick, John L.; and Holland, G. Neil, 4,797,617, Cl. 324-322.000.
Pickett, James K., to Delco Electronics Corporation. CMOS binary equals comparator with carry in and out. 4,797,650, Cl. 340-146.200.
Pieper, Helmut, to Nikolaus Sorg GmbH & Co. Kg. Cullet preheater. 4,797,092, Cl. 432-95.000.
Pierce, Wayne M. Method of stringing cable from a spool mounted on a wheeled vehicle and a system for performing the method. 4,796,826, Cl. 242-86.50R.
Pierce, William W.; June, George; Meadows, James M.; and Cheek, Albert G., to Pierce, William W. Method of preparing a comestible with insert. 4,797,291, Cl. 426-63.000.
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Pietrogrande, Stefano: *See*—
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Pillai, Krishna K., to ABB Stal AB. Power plant burning fuel in a fluidized bed. 4,796,568, Cl. 122-4.00D.
Pinder, John A. Aerobic composting apparatus. 4,797,367, Cl. 435-313.000.
Pinnow, Kenneth E.: *See*—
Eckenrod, John J.; Rhodes, Geoffrey O.; Pinnow, Kenneth E.; and Royer, William E., 4,797,252, Cl. 420-42.000.
Pinol, Augusto C.: *See*—
Constansa, Jordi F.; Pinol, Augusto C.; and Corominas, Juan P., 4,797,482, Cl. 544-33.000.
Pinson, George T., to Boeing Company, The. Optical fiber guided tube-launched projectile system. 4,796,833, Cl. 244-3.120.
Pinza, Mario; and Pfeiffer, Ugo C., to I.S.F. Societa Per Azioni. Process for the preparation of pyrrolidone derivatives. 4,797,496, Cl. 548-544.000.
Pioneer Electronic Corporation: *See*—
Hirano, Toshio, 4,797,869, Cl. 369-75.200.
Manabe, Masamichi, 4,797,726, Cl. 357-70.000.
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Tanaka, Fujio, 4,797,935, Cl. 381-205.000.
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Karamata, Dimitri; and Piot, Jean-Christophe, 4,797,279, Cl. 424-93.000.
Piretti, Giancarlo. Chair with hinged backrest. 4,796,952, Cl. 297-340.000.
Piskoti, Charles, to Genesee Polymers Corporation. Non-transferring dry-film mold release agent. 4,797,445, Cl. 524-588.000.
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Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,797,832, Cl. 364-478.000.
Pitney Bowes Inc.: *See*—
Erwin, Timothy R., 4,796,526, Cl. 101-65.000.
Erwin, Timothy R., 4,796,527, Cl. 101-70.000.
Pittman, Susan. Learning board. 4,797,103, Cl. 434-211.000.
Pitzele, Barnett S.; Hansen, Donald W., Jr.; Hamilton, Robert W.; Pilipauskas, Daniel R.; and Clare, Michael, to G. D. Searle & Co. N-terminally substituted tyrosyl alanine. 4,797,470, Cl. 530-331.000.
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Plessey Overseas Limited: *See*—
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Podgorney, Harvey J.: *See*—
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Lower, William E.; and Pogue, Glenn J., 4,797,204, Cl. 209-237.000.
Pohlmann, Klaus E.: *See*—
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Polak, Anthony J.; and Petty-Weeks, Sandra, to Allied-Signal Inc. Hydrogen separation and electricity generation using novel electrolyte membrane. 4,797,185, Cl. 204-129.000.
Polaroid Corporation: *See*—
Cocco, Vincent L., 4,797,761, Cl. 360-99.060.
Fantone, Stephen D., 4,796,969, Cl. 350-96.180.
Polaschegg, Hans-Dietrich, to Fresenius AG. Apparatus for infusion and removal of samples of blood and other body fluids. 4,796,644, Cl. 128-760.000.
Polaschegg, Hans-Dietrich: *See*—
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Pollack, Gordon P.: *See*—
Malhi, Satwinder S.; and Pollack, Gordon P., 4,797,373, Cl. 437-60.000.
Pollack, Jack, to Amtel, Inc. Anchor line-stabilized system. 4,797,033, Cl. 405-202.000.
Pomper, Seymour; Cole, Gary W.; and Davis, James R., to Nabisco Brands, Inc. Active dried yeast. 4,797,365, Cl. 435-256.000.
Ponce, Juan E.: *See*—
Eller, J. David; and Ponce, Juan E., 4,797,067, Cl. 417-43.000.
Ponticello, Gerald S.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,797,413, Cl. 514-432.000.
Ponziani, Richard L.; Davies, William E.; and Trittschuh, Everett P., III, to General Motors Corporation. Printed circuit board with integral electrical connector and method for making it using wave soldering. 4,797,110, Cl. 439-83.000.
Pope, Kevin T.; and Trimble, David C., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communication system dynamic conferencer circuit. 4,797,877, Cl. 370-62.000.
Portugall, Michael; Blinne, Gerd; and Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Wholly aromatic mesomorphic polyether esters and the preparation thereof. 4,797,465, Cl. 528-176.000.
Pospischil, Reginhard; Breitfelder, Peter; and Timmermann, Uwe, to Siemens Aktiengesellschaft. Method for monitoring and controlling the traffic in digital transmission networks. 4,797,875, Cl. 370-92.000.
Poveromo, Melvin D. Resilient denture connecting device. 4,797,099, Cl. 433-169.000.
Powell, John H., to British Aerospace Public Limited Company. Resource allocation system and method. 4,797,839, Cl. 364-554.000.
Pozzobon, Alessandro; and Manfre, Pietro, to Nordica S.p.A. Winder safety device, particularly for ski boots. 4,796,829, Cl. 242-100.000.
PQ Corporation: *See*—
Berg, Kenneth A., 4,797,294, Cl. 426-330.400.
Prager, Lee A.; and Ide, Mason, to GTE Products Corporation. PTC thermistor heating device. 4,797,534, Cl. 219-326.000.
Prater, Ronald E. Mandrel for making elastomeric articles. 4,797,081, Cl. 425-275.000.

Premier Brands U.K. Limited: *See*—
Rimmer, James R.; and Sweeney, Ronald M., 4,796,409, Cl. 53-438.000.

Prenner, Christian: *See*—
Chahabadi, Ziaedin; and Prenner, Christian, 4,797,874, Cl. 370-16.000.

Prestolite Wire Corporation: *See*—
Sturdevan, Ronald P.; and Pickelhaupt, Alexander J., 4,797,115, Cl. 439-125.000.

Preus, Herman A.: *See*—
Krueger, Clyde A.; Krueger, Katharine C.; and Preus, Herman A., 4,796,378, Cl. 43-43.200.

Prezas, Dimitrios P.: *See*—
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Price, Anthony G.; Campbell, Roy; and Henson, Eric, to Lucas Industries, Ltd. Self-energizing disc brakes. 4,796,730, Cl. 188-71.600.

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Price, John F.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,797,180, Cl. 204-1.00T.

Prichard, Richard M. H., to Vetco Gray Inc. Subsea multiway hydraulic connector. 4,796,922, Cl. 285-26.000.

Pridgen, Evans H.: *See*—
Berger, Jean P.; Pridgen, Evans H.; and Owens, Alfred W., 4,796,560, Cl. 118-211.000.

Prima Meat Packers, Ltd. Research and Development Center: *See*—
Kimura, Masatoshi; Okuda, Hiroshi; Fujikawa, Yujiro; and Inomata, Tatsuaki, 4,796,411, Cl. 53-453.000.

Pro Power Corporation: *See*—
Anderson, Harvey G., 4,796,502, Cl. 83-834.000.

Proctor, David C.; and Proctor, James M. Creeper for handicapped children. 4,796,903, Cl. 280-87.02W.

Proctor & Gamble Company, The: *See*—
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Public Health Laboratory Service Board: *See*—
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Pujado, Peter R., to UOP Inc. Process for recovery of butene-1 from mixed C4 hydrocarbons. 4,797,133, Cl. 44-53.000.

Puretz, Joseph: *See*—
DeFreeze, Richard K.; Elliott, Richard A.; and Puretz, Joseph, 4,797,892, Cl. 372-50.000.

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Fowler, David E., 4,797,128, Cl. 8-137.000.

Quaglino, Carl A., to Mobil Oil Corporation. Method for shot point analysis of seismic reflection signals. 4,797,860, Cl. 367-47.000.

Quate, Calvin F., to Xerox Corporation. Polychromatic acoustic ink printing. 4,797,693, Cl. 346-140.00R.

Qvist, Lars M.: *See*—
Kubat, Josef; and Qvist, Lars M., 4,797,135, Cl. 44-500.000.

Raad, Bernard A.; and Schott, Edmund A., to Sundstrand Corporation. Brushless generator with minimal axial length. 4,797,590, Cl. 310-68.00D.

Raber, Peter E.: *See*—
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Rabideau, Phillip A. Diving plug fish lure. 4,796,379, Cl. 43-42.480.

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Rabinow, Jacob. Lock with key isolation using transfer tumblers. 4,796,447, Cl. 70-495.000.

Rabinow, Jacob. Lock with reference plate. 4,796,448, Cl. 70-495.000.

Racal Data Communications Inc.: *See*—
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Rademacher, Karl-Heinz; and Wolf, Theo, to Robert Bosch GmbH. Cassette deck with combination tape pull-out & tensioning levers. 4,797,760, Cl. 360-95.000.

Raether, Wolfgang: *See*—
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Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, to Ferrofluidics Corporation. Compact ferrofluidic electrically conducting sealed bearing. 4,797,013, Cl. 384-462.000.

Ramler, Johann: *See*—
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Rammage, Robert L.: *See*—
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Ramunas, Valdas S., to Erickson Tool Company. Robot overload detection mechanism. 4,797,564, Cl. 307-119.000.

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Rapailver, Benny L. Dump fitting for sewer hose. 4,796,926, Cl. 285-181.000.

Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased (by Ibragimova, Samaya N. K., administrator), to Azerbaidzhansky Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Neftyanogo Mashinostroenia. Method for making sucker rods. 4,796,799, Cl. 228-155.000.

Rasshofer, Werner: *See*—
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Ratcliff, Reginald, to Solid State Systems, Inc. Conferencing bridge. 4,797,876, Cl. 370-62.000.

Rathmann, Dietrich: *See*—
Scholl, Thomas; Serini, Volker; Rathmann, Dietrich; Savage, Ross; and Kircher, Klaus, 4,797,435, Cl. 524-89.000.

Ratner, Harvey. Method and apparatus for juggling. 4,796,883, Cl. 272-93.000.

Rattner, Manfred: *See*—
Heumann, Reiner; Noske, Erich; and Rattner, Manfred, 4,796,613, Cl. 128-24.00A.

Rausing, Hans, to AB Tetra Pak. Packing container provided with opening arrangement. 4,796,760, Cl. 206-606.000.

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Raynor, Leighton A. Truck bed liner with ballast chamber. 4,796,914, Cl. 280-757.000.

Raytheon Company: *See*—
Hurley, James E.; and Stettler, Robert H., 4,796,600, Cl. 126-273.00H.
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RCA Licensing Corporation: *See*—
Doty, James H., II; and Lendaro, Jeffery B., 4,797,771, Cl. 361-88.000.
Filliman, Paul D., 4,797,634, Cl. 331-12.000.

Rebsamen, Arthur; and Hablutzel, Bruno, to Maschinenfabrik Schweiter AG. Apparatus for joining two thread ends by splicing. 4,796,418, Cl. 57-22.000.

Reddy, Malireddy S. Enhancement of lactobacillus acidophilus growth and viability in yogurt and other cultured dairy products. 4,797,289, Cl. 426-43.000.

Redicon Corporation: *See*—
Bulso, Joseph D., Jr.; and McClung, James A., 4,796,454, Cl. 72-350.000.

Reed, Lowell M., to Parco Mast and Substructures, Inc. Dual cluster crown block. 4,796,863, Cl. 254-337.000.

Reese, Hewitt W. Bone clamp and method. 4,796,612, Cl. 128-92.0YF.

Reeve, Michael H.; and Cassidy, Stephen A., to British Telecommunications plc. Optical fibre transmission lines. 4,796,970, Cl. 350-96.230.

Reeves, Kevin E.: *See*—
Santhouse, Daniel; and Reeves, Kevin E., 4,797,533, Cl. 219-225.000.

Regel, Edmond R. Support device for modular wall unit. 4,796,845, Cl. 248-243.000.

Regel, Erik: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,797,499, Cl. 549-559.000.

Regie Nationale des Usines Renault: *See*—
Hanneton, Jean-Jacques; and Sivori, Michel, 4,796,685, Cl. 164-203.000.

Regna, Richard C., to Telectronics N.V. Cardiac pacemaker with combined defibrillation and electrosurgery protection. 4,796,630, Cl. 128-419.00D.

Reichmann, Wolfgang W., to Mobay Corporation. Foam systems and ASTM E-84 class 1 rated foams produced therefrom. 4,797,428, Cl. 521-137.000.

Reid, Joyce P. Barbecue sauce sprayer. 4,796,806, Cl. 239-11.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Balk, Hermann, 4,797,079, Cl. 425-140.000.
Reifenhauser, Hans, 4,797,083, Cl. 425-378.100.

Reifenhauser, Hans, to Reifenhauser GmbH & Co. Maschinenfabrik. Extrusion die for making a foamed thermoplastic web. 4,797,083, Cl. 425-378.100.

Reiff, Helmut: *See*—
Sanders, Josef; Reiff, Helmut; Balle , Gerhard; and Dieterich, Dieter, 4,797,427, Cl. 521-159.000.

Reil, Wilhelm, to Tetra Park Finance & Trading S.A. Fluid pack with a tapered upper portion. 4,796,802, Cl. 229-108.000.

Reilly, Clyde L. Tree transport trailer. 4,796,941, Cl. 296-3.000.

Reimers, Eric W. Cart bag for golf. 4,796,752, Cl. 206-315.300.

Rein, Robert G., Jr. Photoelectric ice accumulation monitor using dual detectors. 4,797,660, Cl. 340-583.000.

Reinecke, Paul: *See*—
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,797,412, Cl. 514-383.000.
Reinke, Dietmar; and Schmidt, Theo. Continuous manufacture of a perforated plastic film. 4,797,246, Cl. 264-504.000.
Reitter, Erhardt, to Hehl, Karl. Hydraulic element and drawing die assembly. 4,796,453, Cl. 72-347.000.
Renaud, Loic, to Hay & Forage Industries. Method and apparatus for wrapping bales of crop material. 4,796,524, Cl. 100-3.000.
Rennard, Robert E., to Hewlett-Packard Company. Zero-setback sliding load for network analyzer calibration. 4,797,642, Cl. 333-22.00R.
Reuschling, Dieter: *See*—
Lohaus, Gerhard; Dittmar, Walter; Hanel, Heinz; Raether, Wolfgang; Reuschling, Dieter; and Grobel, Bengt-Thomas, 4,797,409, Cl. 514-345.000.
Rex, Bertram R.: *See*—
Lindner, Richard; and Rex, Bertram R., 4,797,720, Cl. 357-39.000.
Reynolds, Gordon F.: *See*—
Liggins, Brian D.; Round, Timothy S.; Welch, Stuart J.; and Reynolds, Gordon F., 4,796,923, Cl. 285-27.000.
Rheinmetall GmbH: *See*—
Koine, Richard, 4,796,512, Cl. 89-11.000.
Rhodes, Geoffrey O.: *See*—
Eckenrod, John J.; Rhodes, Geoffrey O.; Pinnow, Kenneth E.; and Royer, William E., 4,797,252, Cl. 420-42.000.
Rhodes, William H.; Wei, George C.; and Fryburg, George A., to GTE Laboratories Incorporated; and GTE Product Corp. Rapid-sintering of alumina. 4,797,238, Cl. 264-65.000.
Rhone-Poulenc Chimie: *See*—
Letoffe, Michel; and Barrandon, Georges, 4,797,462, Cl. 528-12.000.
Peccoux, Pierre-Michel, 4,797,439, Cl. 524-188.000.
Ribalta Baro, Jose M.: *See*—
Frigola Constansa, Jordi; Ribalta Baro, Jose M.; and Campon Pardo, Julio, 4,797,483, Cl. 544-49.000.
RICAL S.A.: *See*—
Obadia, Jacques, 4,796,769, Cl. 215-232.000.
Ricci, Robert L.: *See*—
Andrew, Gary D.; Galla, Edward A.; and Ricci, Robert L., 4,797,240, Cl. 264-46.400.
Richard W. Hansen. Portable rock crusher. 4,796,820, Cl. 241-69.000.
Richards, James A.; and Stefanek, Ronald T., to Folger Adam Company. Pulsed power supply. 4,797,779, Cl. 361-154.000.
Richardson, Brian P.; Engel, Gunter; Giger, Rudolf K. A.; and Vasella, Andrea, to Sandoz Ltd. Amides and esters containing bridged piperidines and use as serotonin M antagonists. 4,797,406, Cl. 514-299.000.
Richardson, Timothy M. Power plant. 4,797,563, Cl. 290-54.000.
Richesson, Roger W.: *See*—
Brown, Robert L.; and Richesson, Roger W., 4,796,469, Cl. 73-49.200.
Richter, Paul A. Rotary/linear convertor. 4,796,514, Cl. 92-33.000.
Ricoh Company, Ltd.: *See*—
Furukawa, Tatsuya, 4,797,688, Cl. 346-75.000.
Inaba, Fumio; Ito, Hiromasa; Onodera, Noriaki; and Mizuyoshi, Akira, 4,797,890, Cl. 372-46.000.
Murayama, Noboru; and Shimura, Hiroshi, 4,797,943, Cl. 382-54.000.
Sato, Kei; and Murayama, Noboru, 4,797,809, Cl. 364-200.000.
Tsubuko, Kazuo, 4,797,341, Cl. 430-114.000.
Watada, Atsuyuki; and Ohmi, Fumiya, 4,797,331, Cl. 428-694.000.
Yoshimura, Tsuyoshi, 4,796,963, Cl. 350-6.800.
Ricoh Research Institute of General Electronics: *See*—
Inaba, Fumio; Ito, Hiromasa; Onodera, Noriaki; and Mizuyoshi, Akira, 4,797,890, Cl. 372-46.000.
Riebel, Hans-Jochem: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,797,484, Cl. 544-215.000.
Riediger, Craig W.: *See*—
Fee, David M.; and Riediger, Craig W., 4,796,736, Cl. 192-4.00C.
Rilling, Kenneth. Multipath reduction system. 4,797,950, Cl. 455-276.000.
Rimbault, Christian G., to Zyma SA. Naphthothiophene derivatives and their use as respiratory enhancing agents. 4,797,414, Cl. 514-443.000.
Rimland, Bernard. Disposable hand grip for use with plastic bag loop handles. 4,796,940, Cl. 294-171.000.
Rimmer, James R.; and Sweeney, Ronald M., to Premier Brands U.K. Limited. Production of tea and the like bags. 4,796,409, Cl. 53-438.000.
Rios, Jess, to Tekmate Industries Inc. Portable security monitor and time recording. 4,797,663, Cl. 340-691.000.
Rishel, Paul E.: *See*—
Kaurich, Michael S.; and Rishel, Paul E., 4,796,915, Cl. 280-802.000.
Rix, Emmet T. Tiltable back traction table having adjustable balance point and bumper. 4,796,609, Cl. 128-74.000.
Robello, Douglas R.; Ulman, Abraham; and Willand, Craig S., to Eastman Kodak Company. Optical article containing a polymeric matrix exhibiting a high level of second order polarization susceptibility. 4,796,971, Cl. 350-96.340.
Robert Bosch GmbH: *See*—
Bruhmann, Werner, 4,796,581, Cl. 123-373.000.
Hofer, Gerald; Laufer, Helmut; and Straubel, Max, 4,796,592, Cl. 123-502.000.
Jonner, Wolf-Dieter; and Zechmann, Jurgen, 4,796,739, Cl. 192-13.00R.
Kehl, Georg; and Schafer, Ernst-Dieter, 4,796,667, Cl. 137-629.000.
Klemmer, Wolfram; and Kirschenstein, Reinhard, 4,797,744, Cl. 358-164.000.
Rademacher, Karl-Heinz; and Wolf, Theo, 4,797,760, Cl. 360-95.000.
Robert Hooke Memorial Laboratories, Inc.: *See*—
Wiley, Wallace F., 4,797,661, Cl. 340-664.000.
Robinson, Bernard L.; and Pickard, George L., to Homestead Products, Inc. Anchoring of truck bed liners. 4,796,942, Cl. 296-39.200.
Rocci, Joseph A.; Crosetto, John; Earle, Kent L.; and Kirby, David W., to Etcon Corporation. Wire length meter suppling current to a wire from which a signal representative of length is derived. 4,797,604, Cl. 324-65.00R.
Rockett, Leonard R., Jr., to International Business Machines Corporation. High density, high performance, single event upset immune data storage cell. 4,797,804, Cl. 365-154.000.
Rockwell International Coporation: *See*—
Ashcraft, William D., 4,797,746, Cl. 358-140.000.
Rockwool International A/S: *See*—
Jensen, Leif M., 4,797,142, Cl. 65-2.000.
Rodionov, Jury A.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Rodrigues, Pedro: *See*—
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Roemke, Lowell W.; and Stevenson, Hildreth W., to B.F. Goodrich Company, The; and B.F. Goodrich Company, The. Radient heat resistant stencilible inflatable fabric and method. 4,797,306, Cl. 427-261.000.
Rogers, David W.: *See*—
Yu, Edward K.; and Rogers, David W., 4,796,536, Cl. 102-505.000.
Rogers, H. Gardner. Candle lantern apparatus. 4,797,090, Cl. 431-290.000.
Rogers, Lloyd W.; and Compeau, David E., to General Motors Corporation. Inhibit control of a belted vehicular passive restraint system having door-mounted retractors. 4,796,916, Cl. 280-803.000.
Rogers, Ronald: *See*—
Amabile, Gerald; and Rogers, Ronald, 4,796,913, Cl. 280-751.000.
Roggero, Arnaldo; Bertolini, Guglielmo; and Busetto, Carlo, to Enitricerche S.p.A. Solid polymeric stabilizer compounds and process for their manufacture. 4,797,451, Cl. 525-332.900.
ROHM GmbH Chemische Fabrik: *See*—
Grob, Heinz; Pohlmann, Klaus E.; and Schikowsky, Harmut, 4,797,173, Cl. 156-498.000.
Rohm and Haas Company: *See*—
Amick, David R.; Jones, Charles E.; and Hughes, Kathleen A., 4,797,223, Cl. 252-174.230.
Rohrbach, Manfred: *See*—
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Rohulich, John J.; and Keys, John B., to NCR Corporation. Speaker volume control apparatus and method. 4,797,932, Cl. 381-104.000.
Rokutan, Takao, to Olympus Optical Co., Ltd. Method for reproducing data recorded on optical card. 4,797,872, Cl. 369-109.000.
Roling, Paul V., to Betz Laboratories, Inc. Method and composition for inhibiting acrylate ester polymerization. 4,797,504, Cl. 560-4.000.
Rolls-Royce plc: *See*—
Farrar, Peter G. G.; Wright, Eric; and Peacock, Nicholas J., 4,796,424, Cl. 60-268.000.
Wing, Rodney G., 4,796,343, Cl. 29-156.80R.
Roncucci, Romeo: *See*—
Diaz, Joseph; Demarne, Henri; Roncucci, Romeo; and Schmelck, Paul-Henry, 4,797,469, Cl. 530-324.000.
Ronk, Jerry: *See*—
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Roos, Jurgen: *See*—
Mertens, Theobald; and Roos, Jurgen, 4,796,875, Cl. 267-140.100.
Rosen, Richard A. Method and means for adapting plumbing valve stems to desired trim. 4,796,348, Cl. 29-401.100.
Rosier, Hendrik E., to Huck Manufacturing Company. Compact offset nose assembly for setting fasteners. 4,796,455, Cl. 72-391.000.
Ross, Larry I.: *See*—
Rutkowski, David J.; Ver Ploeg, Wendell J.; and Ross, Larry I., 4,796,712, Cl. 172-7.000.
Rotem, Haim; Shimoni, Yair; and Goldberg, Shmuel, to Elscint Ltd. Determining and correcting for phase jumps. 4,797,615, Cl. 324-309.000.
Rotex, Inc.: *See*—
Lower, William E.; and Pogue, Glenn J., 4,797,204, Cl. 209-237.000.
Round, Timothy S.: *See*—
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Row Runner Corp. of America: *See*—
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Rowen, Michael J.: *See*—
Ference, Jonathan H.; Blonstein, Steven M.; Rowen, Michael J.; and Newman, Robert C., Jr., 4,797,599, Cl. 315-194.000.

Royal Textile Mills, Inc.: *See—*
Atwater, W. David, 4,796,303, Cl. 2-24.000.
Royer, William E.: *See—*
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Rubbermaid Commercial Products Inc.: *See—*
Hamann, David L., 4,796,369, Cl. 40-606.000.
Rueppel, Rainer A.: *See—*
Massey, James L.; and Rueppel, Rainer A., 4,797,922, Cl. 380-46.000.
Ruhl, Walter F.: *See—*
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Russell, Larry R.; and Corbett, Kevin T., to Exxon Production Research Company. Drill pipe protector. 4,796,670, Cl. 138-110.000.
Rutkowski, David J.; Ver Ploeg, Wendell J.; and Ross, Larry I., to Ford Motor Company. Draft load control systems. 4,796,712, Cl. 172-7.000.
Rutter, Harold T.; and Ondrus, Joseph F., to Sunnen Products Company. Means for supporting a gaging device such as a dial bore gage during the setting thereof. 4,796,363, Cl. 33-164.00R.
Ryang, Hong-Son, to BASF Corporation. Curable resin systems containing cyanate ester functional oxazolinylpolysiloxanes. 4,797,454, Cl. 525-476.000.
Ryer, Jack: *See—*
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S. C. Johnson & Son, Inc.: *See—*
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S.I.F.I. Societa Industria Farmaceutica Italiana S.p.A.: *See—*
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Sabin, Cullen M., to Thermonetics Corporation. Techniques useful in determining liquid levels. 4,796,471, Cl. 73-295.000.
Sachdeva, Abnash C.: *See—*
Verret, Douglas P.; Smayling, Michael C.; Sachdeva, Abnash C.; and Keller, Stephen A., 4,797,372, Cl. 437-034.000.
Sachenik, Paul A.: *See—*
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Saeki, Hiroshi; and Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Solid lubricant bearing. 4,797,011, Cl. 384-13.000.
Saeki, Noboru: *See—*
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Safety Research and Manufacturing, Inc.: *See—*
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St. Onge, Henri S., to Duratron Systems Limited. Product for relining sewers and water pipes. 4,796,669, Cl. 138-97.000.
Saisu, Yasushi: *See—*
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Saito, Masato; Fukuyama, Keiji; Ishida, Masako; Watanabe, Keiji; Kamata, Toyokazu; and Sano, Kinjiro, to Mitsubishi Denki Kabushiki Kaisha. Cathode for electron tube. 4,797,593, Cl. 313-346.00R.
Saito, Minoru: *See—*
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.
Saito, Tetsuo, to Tachi-S Ltd. Seat back rear structure. 4,796,954, Cl. 297-452.000.
Saitor, Katuo: *See—*
Oikawa, Katsuya; Egami, Hidemi; Saitor, Katuo; and Satomura, Hiroshi, 4,797,598, Cl. 315-85.000.
Saitou, Mitsuo; Urabe, Shigeharu; and Ozeki, Katsuhisa, to Fuji Photo Film Co., Ltd. Silver halide emulsions comprising hexagonal monodisperse tabular silver halide grains. 4,797,354, Cl. 430-567.000.
Saji, Yoshiro; and Tada, Eiichi, to Saji, Yoshiro; and Koatsu Gas Kogyo Co., Ltd. Superconductor for magnetic field shielding. 4,797,646, Cl. 335-301.000.
Sakaguchi, Masaaki: *See—*
Chikamasa, Hiroshi; Takagi, Akira; and Sakaguchi, Masaaki, 4,796,824, Cl. 242-76.000.
Sakai, Katsuyoshi: *See—*
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Sakai, Kunihiro: *See—*
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Sakamoto, Kiichiro: *See—*
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Sakamoto, Takurou: *See—*
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Sakashita, Kunio: *See—*
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Sakuramoto, Takahumi; Asoshina, Eishi; Tominaga, Takashi; Ijichi, Ichiro; Kamei, Kiyohiro; and Konishi, Toshiharu, to Nitto Electric Industrial Co., Ltd. Process for fixing metal powder molding at sintering. 4,797,251, Cl. 419-9.000.
Salyer, Ival O., to University of Dayton. Phase change compositions. 4,797,160, Cl. 106-96.000.
Salzman, Gary C.; and Kupperman, Robert H., to United States of America, Energy. Optically active biological particle distinguishing apparatus. 4,796,995, Cl. 356-368.000.
SAMES S.A.: *See—*
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Samsel, Jason M.: *See—*
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Sanden Corporation: *See—*
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Sanders, Josef; Reiff, Helmut; Balle , Gerhard; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Aromatic diamines containing sulfonic acid aryl esters, a process for their production and their use in the production of polyurethane plastics. 4,797,427, Cl. 521-159.000.
Sandiford, Burton B.; and Zillmer, Roger C., to Cities Service Oil and Gas Corporation. Process for retarding fluid flow. 4,796,700, Cl. 166-270.000.
Sandoz Ltd.: *See—*
Baumann, Hans-Peter, 4,797,131, Cl. 8-436.000.
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Richardson, Brian P.; Engel, Gunter; Giger, Rudolf K. A.; and Vasella, Andrea, 4,797,406, Cl. 514-299.000.
Welzel, Dieter; and Buhlmann, Hans, 4,797,404, Cl. 514-288.000.
Sanger, Hans D., to Hoechst Aktiengesellschaft. Apparatus for separating test strips. 4,796,744, Cl. 198-397.000.
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Santel, Hans-Joachim: *See—*
Sasse, Klaus; Hagemann, Hermann; Santel, Hans-Joachim; and Schmidt, Robert R., 4,797,146, Cl. 71-92.000.
Santhouse, Daniel; and Reeves, Kevin E., to Clairol Incorporated. Electric hair appliance having an improved handle and actuating mechanism construction. 4,797,533, Cl. 219-225.000.
Sanyei Corp.: *See—*
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Sapelak, Ronald: *See—*
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Saputo, Vincent: *See—*
Sevier, David C., 4,797,214, Cl. 210-651.000.
Sarazen, David J., to M.A.N. Roland Druckmaschinen AG. Separated ink fountain for a flexographic printing machine. 4,796,528, Cl. 101-208.000.
Sarcona, Anthony O., to Sarcona Bros. Item of jewelry including a gem slidable within a gem insert. 4,796,442, Cl. 63-26.000.
Sarcona Bros.: *See—*
Sarcona, Anthony O., 4,796,442, Cl. 63-26.000.
Sartori, Francesco. Broom or brush with hinged handle. 4,796,324, Cl. 15-144.00R.
Sasa, Nobumasa: *See—*
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Sasada, Shigeru; Yamamoto, Masahiro; Shimizu, Yoshio; and Sumioka, Tsutomu, to Dainippon Screen Mfg., Co., Ltd. Image scanning apparatus. 4,797,711, Cl. 355-32.000.

Sasaki, Hiroaki; Hasegawa, Kazuo; Fukukawa, Noboru; and Yata, Masanori, to Alps Electric Co., Ltd. Disc driving device. 4,797,769, Cl. 360-99.080.

Sasaki, Kenichi: *See*—
Okubo, Akira; and Sasaki, Kenichi, 4,797,647, Cl. 336-175.000.

Sasaki, Migaku; Koike, Eiji; Ohtomo, Toshio; and Hirose, Jun, to ATOM Kabushiki Kaisha. Incubator. 4,796,605, Cl. 600-22.000.

Sasaki, Minoru, to Kabushiki Kaisya Advance Kaihatsu Kenkyujo. Artifact detecting apparatus in the measurement of a biological signal. 4,796,638, Cl. 128-696.000.

Sasatani, Tomohiko: *See*—
Sato, Chikara; Nakayama, Tadayoshi; Takahashi, Koji; and Sasatani, Tomohiko, 4,797,741, Cl. 358-138.000.

Sasse, Klaus; Hagemann, Hermann; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal 2-[4-substituted carboxyamino-phenyl mercapto)]-subsituted pyrimidines. 4,797,146, Cl. 71-92.000.

Sata, Shingo: *See*—
Baldwin, David R.; and Sata, Shingo, 4,797,755, Cl. 360-49.000.

Sata, Toshio: *See*—
Akao, Mutsuo; Endo, Hisao; Sata, Toshio; and Ishiguro, Masanori, 4,796,823, Cl. 242-71.800.

Satake, Masaki: *See*—
Yamada, umito; Kawasaki, Hiroshi; and Satake, Masaki, 4,797,353, Cl. 430-434.000.

Sato, Chikara; Nakayama, Tadayoshi; Takahashi, Koji; and Sasatani, Tomohiko, to Canon Kabushiki Kaisha. Information signal transmission system. 4,797,741, Cl. 358-138.000.

Sato, Hisao: *See*—
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, 4,797,143, Cl. 65-3.120.

Sato, Kei; and Murayama, Noboru, to Ricoh Company, Ltd. Direct memory access device for multidimensional data transfers. 4,797,809, Cl. 364-200.000.

Sato, Kenichi: *See*—
Nagai, Tadao; and Sato, Kenichi, 4,797,870, Cl. 369-100.000.

Sato, Kenichiro, to Sanden Corporation. Method and apparatus for controlling an automotive air conditioning system. 4,796,438, Cl. 62-133.000.

Sato, Koji; Kurakake, Masahiro; and Fujiwaki, Kazuo, to Sumitomo Electric Industries, Ltd. Optical character reader. 4,797,940, Cl. 382-9.000.

Sato, Mamoru: *See*—
Suzuki, Yoshiyuki; Funada, Masahiro; Sato, Mamoru; and Sato, Yukio, 4,797,945, Cl. 382-56.000.

Sato, Tsunehiko: *See*—
Shibata, Norio; Sato, Tsunehiko; Takeda, Hideo; and Chino, Naoyoshi, 4,796,557, Cl. 118-62.000.

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Suzuki, Yoshiyuki; Funada, Masahiro; Sato, Mamoru; and Sato, Yukio, 4,797,945, Cl. 382-56.000.

Satomura, Hiroshi: *See*—
Oikawa, Katsuya; Egami, Hidemi; Saitor, Katuo; and Satomura, Hiroshi, 4,797,598, Cl. 315-85.000.

Sauer, Donald G., to American National Can Company. Multiwalled container and method of making same. 4,797,244, Cl. 264-266.000.

Savage, Jack W.; and Savage, John R., to General Motors Corporation. Magnetic drive control system for a multiple cooling fan installation. 4,797,600, Cl. 318-254.000.

Savage, John R.: *See*—
Savage, Jack W.; and Savage, John R., 4,797,600, Cl. 318-254.000.

Savage, Ross: *See*—
Scholl, Thomas; Serini, Volker; Rathmann, Dietrich; Savage, Ross; and Kircher, Klaus, 4,797,435, Cl. 524-89.000.

Savage, Shaun V. V.; and Harris, Johnny M., to Unisys Corporation. Direct memory access controller for improved system security, memory to memory transfers, and interrupt processing. 4,797,853, Cl. 364-900.000.

Sawada, Akihiro: *See*—
Hatta, Naoyuki; Yoshihara, Hideo; Izaki, Takeshi; Sawada, Akihiro; Yamamoto, Takemi; and Sangyoji, Kazuo, 4,797,107, Cl. 434-408.000.

Sawara, Kenichi: *See*—
Kadokura, Hidekimi; Sawara, Kenichi; and Yako, Tadaaki, 4,797,500, Cl. 556-1.000.

Sawtell, Ralph R.: *See*—
Bretz, Philip E.; Sawtell, Ralph R.; and Hunt, Warren H., Jr., 4,797,165, Cl. 148-12.70A.

Scaramucci, John P. Fabricated check valve construction. 4,796,663, Cl. 137-515.500.

Schafer, Ernst-Dieter: *See*—
Kehl, Georg; and Schafer, Ernst-Dieter, 4,796,667, Cl. 137-629.000.

Schafer, Hermann: *See*—
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; Schafer, Hermann; and Rasshofer, Werner, 4,797,320, Cl. 428-316.600.

Schaffer, Robert: *See*—
Crothers, Paul; and Schaffer, Robert, 4,796,990, Cl. 352-89.000.

Schaire, Scott, to Grumman Aerospace Corporation. Voice recognition process utilizing content addressable memory. 4,797,927, Cl. 381-42.000.

Schammel, Wayne P., to Amoco Corporation. Trimellitic anhydride purification process. 4,797,497, Cl. 549-245.000.

Schar, Anton, to Hammermat AG. Magazine hammer. 4,796,495, Cl. 81-490.000.

Schatz, Oskar. Displacement compressor for supercharging of combustion engines. 4,797,070, Cl. 417-380.000.

Schatzle, Michael: *See*—
Grimm, Stefan; Schatzle, Michael; and Stahr, Fritz, 4,797,463, Cl. 528-60.000.

Schatzmayr, Dieter: *See*—
Buchelt, Benno, 4,796,836, Cl. 244-23.00R.

Scherubel, Gary A., to Petrolite Corporation. Multipurpose aqueous foamer. 4,796,702, Cl. 166-308.000.

Schick, David E. Calculator —horn button. 4,797,538, Cl. 235-1.00D.

Schiel, Christian, to J. M. Voith GmbH. Setting device for adjusting the position of a roll. 4,796,452, Cl. 72-245.000.

Schiel, Christian; and Bauder, Albrecht, to J. M. Voith GmbH. Press nip formed by a deflection-controlled roll in conjunction with a temperature-controlled roll. 4,796,525, Cl. 100-93.0RP.

Schikowsky, Harmut: *See*—
Grob, Heinz; Pohlmann, Klaus E.; and Schikowsky, Harmut, 4,797,173, Cl. 156-498.000.

Schisler, Jacques, to C.E.E. Compagnie Europeene des Emballages. Bundle of supple bags, made of fine material such as plastics material or paper. 4,796,759, Cl. 206-554.000.

Schlaegel, Gene A. Fishing device. 4,796,376, Cl. 43-42.290.

Schleicher, John. Process and apparatus for painting golf holes. 4,797,305, Cl. 427-236.000.

Schlemmer, Lothar: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; and Schlemmer, Lothar, 4,797,453, Cl. 525-397.000.

Schlumberger Technology Corporation: *See*—
Hornby, Brian E., 4,797,859, Cl. 367-31.000.
Upchurch, James M., 4,796,699, Cl. 166-250.000.

Schmelck, Paul-Henry: *See*—
Diaz, Joseph; Demarne, Henri; Roncucci, Romeo; and Schmelck, Paul-Henry, 4,797,469, Cl. 530-324.000.

Schmid, Karl H.: *See*—
Hoefer, Rainer; Schmid, Karl H.; Asbeck, Adolf; and Held, Uwe, 4,797,222, Cl. 252-174.210.

Schmidt, Alfred C.: *See*—
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,797,832, Cl. 364-478.000.

Schmidt, Donald L.: *See*—
Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,797,187, Cl. 204-180.200.
Wessling, Ritchie A.; Schmidt, Donald L.; and Aikawa, Kiyoshi I., 4,797,456, Cl. 525-531.000.

Schmidt, Robert R.: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,797,484, Cl. 544-215.000.
Sasse, Klaus; Hagemann, Hermann; Santel, Hans-Joachim; and Schmidt, Robert R., 4,797,146, Cl. 71-92.000.

Schmidt, Theo: *See*—
Reinke, Dietmar; and Schmidt, Theo, 4,797,246, Cl. 264-504.000.

Schmidt, Wolfgang: *See*—
Schmitt, Klaus G.; and Schmidt, Wolfgang, 4,797,529, Cl. 219-99.000.

Schmitt, Eugene W., to Sloan Valve Company. Compression type truck/trailer brake slack adjuster. 4,796,731, Cl. 188-196.00D.

Schmitt-Henco, Carl: *See*—
Kirchmayr, Karl; Miko, Hans-Jurgen; Watzka, Bruno; Studinka, Josef; and Schmitt-Henco, Carl, 4,797,161, Cl. 106-98.000.

Schmitt, Klaus G.; and Schmidt, Wolfgang, to Emhart Enterprises Corp. Stud welding apparatus. 4,797,529, Cl. 219-99.000.

Schmoll, Heinz; Schubert, Peter; Schubert, Hans A.; Schulze, Klaus; and Kutz, Heinrich, to SMS Hasenclever Maschinenfabrik GmbH. Forging machine. 4,796,456, Cl. 72-402.000.

Schnars, Michael J.; Dolph, Darrel A.; and Liu, Yu-Jih, to Nartron Corporation. Vehicle voice recognition method and apparatus. 4,797,924, Cl. 381-43.000.

Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., to Mine Safety Appliances Company. Method for the detection of noxious gases. 4,797,180, Cl. 204-1.00T.

Schneider, Karen B.: *See*—
Ginn, LeRoy D.; Ginn, LeRoyce S.; and Schneider, Karen B., 4,796,651, Cl. 137-8.000.

Schnelle, Diethard: *See*—
Brodling, Gunter; Feyerabend, Franz; Hubert, Peter; Krahling, Franz; Peitz, Wolfgang; Sewing, Karlernst; and Schnelle, Diethard, 4,797,790, Cl. 362-61.000.

Schofield, John D.; and Slater, Roger, to Imperial Chemical Industries PLC. Dispersed particulate composition. 4,797,440, Cl. 524-239.000.

Scholl, Thomas; Serini, Volker; Rathmann, Dietrich; Savage, Ross; and Kircher, Klaus, to Bayer Aktiengesellschaft. Use of 3-benzalphthalides as UV stabilizers for thermoplastic, aromatic polyesters, polycarbonates and polyester carbonates. 4,797,435, Cl. 524-89.000.

Schott, Edmund A.: *See*—
Raad, Bernard A.; and Schott, Edmund A., 4,797,590, Cl. 310-68.00D.

Schreck, John F.; Coffman, Timmie M.; and Wilmoth, David D., to Texas Instruments Incorporated. Array discharge for biased array. 4,797,857, Cl. 365-203.000.

Schreiber, Hans, to Siemens Aktiengesellschaft. Bipartite generator wheel for an angular pulse generator. 4,797,611, Cl. 324-208.000.

Schreiner, Bruce E.: *See*—
Dombrowski, Anthony E., 4,797,673, Cl. 340-904.000.
Schubach, Frank: *See*—
Schubach, Gary; and Schubach, Frank, 4,797,089, Cl. 431-28.000.
Schubach, Gary; and Schubach, Frank. System control means to pre-heat waste oil for combustion. 4,797,089, Cl. 431-28.000.
Schubert, Dale W., to Barry Wright Corporation. Active vibration isolation system. 4,796,873, Cl. 267-136.000.
Schubert, Hans A.: *See*—
Schmoll, Heinz; Schubert, Peter; Schubert, Hans A.; Schulze, Klaus; and Kutz, Heinrich, 4,796,456, Cl. 72-402.000.
Schubert, Peter, to SMS Hasenclever Maschinenfabrik GmbH. Forging manipulator. 4,796,458, Cl. 72-420.000.
Schubert, Peter: *See*—
Schmoll, Heinz; Schubert, Peter; Schubert, Hans A.; Schulze, Klaus; and Kutz, Heinrich, 4,796,456, Cl. 72-402.000.
Schubert, Peter J., to Delco Electronics Corporation. Self-aligned silicon MOS device. 4,797,718, Cl. 357-23.400.
Schubert, Werner, to Wankel GmbH. Bearing arrangement of an external-axial rotary piston blower. 4,797,078, Cl. 418-206.000.
Schultz, Duane M.; and Wetle, Gerald J., to Illinois Tool Works, Inc. Collection device for a rivet gun. 4,796,794, Cl. 227-156.000.
Schultz, Karl-Heinz: *See*—
Lailach, Gunter; and Schultz, Karl-Heinz, 4,797,163, Cl. 166-437.000.
Schultz, William: *See*—
Schutz, Rudolph W.; and Schultz, William, 4,796,832, Cl. 242-55.300.
Schulz, Paul: *See*—
Schumann, Klaus; Guirr, Ortburg; Schulz, Paul; and Foerg, Franz, 4,797,231, Cl. 252-547.000.
Schulze, Klaus: *See*—
Schmoll, Heinz; Schubert, Peter; Schubert, Hans A.; Schulze, Klaus; and Kutz, Heinrich, 4,796,456, Cl. 72-402.000.
Schumaker, Eugene J.; and Klug, Christopher J., to Adjustable Fixture Co. Medical examining lamp. 4,797,798, Cl. 362-413.000.
Schumann, Klaus; Guirr, Ortburg; Schulz, Paul; and Foerg, Franz, to Henkel Kommanditgesellschaft auf Aktien. Multipurpose cleaning preparations for hard surfaces. 4,797,231, Cl. 252-547.000.
Schuster, Erich; and Kartzow, Manfred, to Ernst Leitz Wetzlar GmbH. Device for automatically determining the deviation between the structures of a pattern and those of an object compared therewith. 4,796,999, Cl. 356-394.000.
Schutz, Gunter: *See*—
Deters, Ludger; Englander, Heinrich; Kabelitz, Hans-Peter; and Schutz, Gunter, 4,797,062, Cl. 415-90.000.
Schutz, Rudolph W.; and Schultz, William, to James River II, Inc. Dispenser for jumbo roll of toilet tissue. 4,796,832, Cl. 242-55.300.
Schweiger, Willy. Process for precluding or reducing the danger to a system and the surroundings thereof by reactive mixtures. 4,797,249, Cl. 376-279.000.
Schwerdt, Paul: *See*—
Hoffmann, Ruediger; Feichtiger, Dieter; and Schwerdt, Paul, 4,796,662, Cl. 137-596.160.
Science Dynamics Corporation: *See*—
Kaplan, Murray; and Humes, Robert W., 4,797,913, Cl. 379-91.000.
Sciortino, Giacomo, to Carl Freudenberg, Firma. Engine mount. 4,796,876, Cl. 267-140.100.
Scott, Michael D.; and Moore, Alan H., to Plessey Overseas Limited. Method for selective heteroepitaxial III–V compound growth. 4,797,374, Cl. 437-129.000.
Scovill Fasteners Inc.: *See*—
Burke, James E., 4,796,339, Cl. 24-662.000.
Scullion, Christopher K.: *See*—
Baggarly, Brad A.; and Scullion, Christopher K., 4,797,830, Cl. 364-464.030.
Scully Andrew J., to United States of America, Army. Two part buckle. 4,796,336, Cl. 24-68.0CD.
Scully, Robert M. Plow/scraper assembly for earth mover vehicle. 4,796,366, Cl. 37-4.000.
Seasholtz, Craig A.: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,797,072, Cl. 417-423.200.
Sedillot, Francois G.: *See*—
Danguy des Deserts, Loic M. J.; Sedillot, Francois G.; and Michel, Dominique, 4,797,034, Cl. 405-202.000.
Seethaler, Franz: *See*—
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Segawa, Hiroshi; and Matsumura, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Pulse generating circuit in a semiconductor integrated circuit and a delay circuit therefor. 4,797,585, Cl. 307-594.000.
Segor, Philip: *See*—
Freville, Robert; and Segor, Philip, 4,796,310, Cl. 4-199.000.
Seibert, Wolfram; Ocvirk, Norbert; Trach, Guenther; and Maas, Joachim, to Alfred Teves GmbH. Brake system with control of brake slip and traction slip. 4,796,959, Cl. 303-119.000.
Seidel, Rudolf, to Benke Instrument & Elektro Ag. Protection means for a process analyzer system. 4,797,254, Cl. 422-49.000.
Seikosha Co., Ltd.: *See*—
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, 4,797,695, Cl. 346-160.000.
Nemoto, Ichiro; Aosaki, Ko; Misawa, Atsushi; and Otora, Takahito, 4,797,699, Cl. 354-246.000.
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,796,978, Cl. 350-337.000.
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Sejimo, Yoshimi; Tsubai, Toshiaki; and Tobinai, Teruhiko, to Walbro Far East, Inc. Anti-overruning device for an internal combustion engine. 4,796,582, Cl. 123-378.000.
Sejimo, Yoshimi: *See*—
Nagasaka, Kohji; Kobayashi, Takeshi; and Sejimo, Yoshimi, 4,796,578, Cl. 123-378.000.
Nagasaka, Kohji; Kobayashi, Takeshi; and Sejimo, Yoshimi, 4,796,583, Cl. 123-378.000.
Sekihara, Kensuke: *See*—
Matsui, Shigeru; Onodera, Takashi; Sekihara, Kensuke; Shiono, Hidemi; and Kohno, Hideki, 4,797,616, Cl. 324-309.000.
Sekiya, Hitoshi: *See*—
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Senator, Stewart: *See*—
DiMatteo, Paul; Chubb, Charles F.; and Senator, Stewart, 4,796,313, Cl. 5-81.00R.
Senda, Atsuo: *See*—
Kaneko, Toshimi; Fujinaga, Ryuichi; Morinaga, Tetsuya; Senda, Atsuo; Numata, Toshi; and Kashio, Hideyuki, 4,797,648, Cl. 336-192.000.
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Serini, Volker: *See*—
Scholl, Thomas; Serini, Volker; Rathmann, Dietrich; Savage, Ross; and Kircher, Klaus, 4,797,435, Cl. 524-89.000.
Serizawa, Shinichiro: *See*—
Igarashi, Akira; Shimomura, Akihiro; and Serizawa, Shinichiro, 4,797,384, Cl. 503-200.000.
Services Equipments France (S.E.F.): *See*—
Hermelin, Rene , 4,796,761, Cl. 211-11.000.
Setsune, Kentaro: *See*—
Kitabatake, Makoto; Setsune, Kentaro; and Wasa, Kiyotaka, 4,796,982, Cl. 350-356.000.
Sevier, David C., to Saputo, Vincent; Saputo, Lorraine; Blaha, Charles; Orsino, Paul; and Accu-Lab, Inc., part interest to each. Method of treatment of waste streams of oil/water emulsions or solutions. 4,797,214, Cl. 210-651.000.
Sevrell, Gosta: *See*—
Bergstrom, Anders; and Sevrell, Gosta, 4,796,746, Cl. 198-463.400.
Sewing, Karlernst: *See*—
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Sezaki, Yoshinori: *See*—
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SGS Microelettronica S.p.A.: *See*—
Aguti, Alberto; Gaibotti, Maurizio; and Masina, Vittorio, 4,797,584, Cl. 307-594.000.
SGS Microelettronica SpA: *See*—
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Shadwick, Robert P.: *See*—
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Shah, Shailesh C.: *See*—
Cowles, Richard A.; Georgalas, Nick; and Shah, Shailesh C., 4,797,444, Cl. 524-501.000.
Shankman, Jay. Chemical and/or radiation decontamination. 4,796,311, Cl. 4-596.000.
Shannon, John M., to U.S. Philips Corporation. Hot charge-carrier transistors. 4,797,722, Cl. 357-34.000.
Shapiro, Jack M.: *See*—
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Sharaby, Zaev; and Vyvoda, Josef C., to B. F. Goodrich Company, The. Stabilized vinyl halide resins and compositions and articles made therefrom. 4,797,443, Cl. 524-347.000.
Sharaby, Zaev, to B.F. Goodrich Company, The. Colloidal stable vinyl halide polymerizations with mercaptan chain transfer agents. 4,797,458, Cl. 526-194.000.
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., to Warner-Lambert Company. Novel drug delivery system. 4,797,288, Cl. 424-476.000.
Sharp Kabushiki Kaisha: *See*—
Aramaki, Yoshihiro, 4,796,850, Cl. 248-674.000.
Katsuta, Yuji; Kita, Sumio; Takano, Sakuharu; and Kamada, Hiroshi, 4,797,946, Cl. 382-61.000.
Koizumi, Satoru; Teshima, Daisuke; and Katayama, Yoshio, 4,797,759, Cl. 360-92.000.
Kotani, Matahira; Hayashi, Motohiko; and Ooi, Yoshikatsu, 4,797,748, Cl. 358-257.000.
Shaw, James D., to Eastman Kodak Company. Slide holder and tip locator. 4,797,257, Cl. 422-65.000.
Shaw, James J.: *See*—
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., 4,797,288, Cl. 424-476.000.
Shea, Allan K.: *See*—
Hayes, William R.; and Shea, Allan K., 4,796,857, Cl. 251-173.000.
Shea, Stephen F.: *See*—
Wakeman, Russell J.; and Shea, Stephen F., 4,796,573, Cl. 123-90.160.

Shearer, Marcia C.: *See*—
Bowie, Betty A.; Hedde, Richard D.; Lindsey, Thomas O.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,797,280, Cl. 424-118.000.
Shelby, Earl. Ventilated hunting clothing. 4,796,304, Cl. 2-94.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Lameris, Herman J., 4,796,570, Cl. 122-7.00R.
Shell Oil Company: *See*—
Ayers, Ray R., 4,797,117, Cl. 439-200.000.
Dewitz, Thomas S., 4,797,262, Cl. 422-142.000.
Evans, Wayne E., 4,797,266, Cl. 423-328.000.
Gergen, William P.; and Lutz, Robert G., 4,797,447, Cl. 525-92.000.
Siddoway, Mark A.; Stidham, Neal D.; and Machmer, William C., 4,797,136, Cl. 44-501.000.
van Lookeren-Campagne, Constant J.; and Obeng, Edward D. A., 4,797,366, Cl. 435-264.000.
Shelley, Joseph F.: *See*—
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Sheppard, William G., to Martin Automatic Fishing Reel Co., Inc. Multiplier fly casting reel with anti-reversing mechanism. 4,796,831, Cl. 242-212.000.
Sherin, Patrick M. Gas cylinder carrier. 4,796,936, Cl. 294-31.200.
Sherwood, Kent. Foam-honeycomb article and method. 4,797,312, Cl. 428-117.000.
Shibata, Norio; Sato, Tsunehiko; Takeda, Hideo; and Chino, Naoyoshi, to Fuji Photo Film Co. Ltd. Device for application with use of web vibration absorber. 4,796,557, Cl. 118-62.000.
Shibauchi, Yoshito: *See*—
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Shiinoki, Kazuaki: *See*—
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Shikama, Shinsuke; Kondo, Mitsuhige; and Toide, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Optical head device having positionally adjustable parts. 4,797,545, Cl. 250-201.000.
Shikhlinsky, Talat M. O.: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
Shimamoto, Mamoru: *See*—
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Shimane, Iwao: *See*—
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Shimano, Osamu: *See*—
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Shimanuki, Haruki; Miyake, Katsuya; Akima, Hideo; and Hoashi, Akira, to Akebono Brake Industry Co., Ltd.; and Fujitsu Limited. Anti-skid control system for motor vehicles. 4,797,825, Cl. 364-426.020.
Shimizu, Ichio, to Hitachi, Ltd. Lead frame and electronic device. 4,797,787, Cl. 361-421.000.
Shimizu, Shigehisa: *See*—
Akiyoshi, Nobuyasu; and Shimizu, Shigehisa, 4,797,691, Cl. 346-108.000.
Shimizu, Yoshio: *See*—
Sasada, Shigeru; Yamamoto, Masahiro; Shimizu, Yoshio; and Sumioka, Tsutomu, 4,797,711, Cl. 355-32.000.
Shimoe, Hiroaki: *See*—
Kashi, Motofumi; and Shimoe, Hiroaki, 4,797,738, Cl. 358-101.000.
Shimogaki, Hisao: *See*—
Takeuchi, Keiji; Nishino, Takashi; Odera, Motoyasu; Shimogaki, Hisao; and Negi, Tahee, 4,797,362, Cl. 435-221.000.
Shimohara, Koichi: *See*—
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, 4,797,400, Cl. 514-255.000.
Shimohashi, Hirotaka: *See*—
Kawai, Yasuo; Yazawa, Kazunaga; Suegara, Nobuo; and Shimohashi, Hirotaka, 4,797,278, Cl. 424-93.000.
Shimomura, Akihiro: *See*—
Igarashi, Akira; Shimomura, Akihiro; and Serizawa, Shinichiro, 4,797,384, Cl. 503-200.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. Fuel control apparatus. 4,796,588, Cl. 123-479.000.
Shimoni, Yair: *See*—
Rotem, Haim; Shimoni, Yair; and Goldberg, Shmuel, 4,797,615, Cl. 324-309.000.
Shimoyama, Yoshiaki: *See*—
Nakayama, Hisanobu; Nakashima, Shouzaburo; Shimoyama, Yoshiaki; and Mori, Yasukazu, 4,797,167, Cl. 148-111.000.
Shimura, Hiroshi: *See*—
Murayama, Noboru; and Shimura, Hiroshi, 4,797,943, Cl. 382-54.000.
Shinoda, Yoshio: *See*—
Onogi, Nobuyoshi; Shimamoto, Mamoru; and Shinoda, Yoshio, 4,797,826, Cl. 364-426.040.
Shinozaki, Takeki: *See*—
Inoue, Tadashi; Ohkoba, Akira; Sakashita, Kunio; Utsunomiya, Akira; Shinozaki, Takeki; and Ieda, Minoru, 4,797,265, Cl. 423-320.000.
Shinpo Kabushiki Kaisha: *See*—
Yamada, Takeshi, 4,796,601, Cl. 126-299.00R.
Shinto Paint Co. Ltd.: *See*—
Yamamoto, Kiyoshi; Nakamura, Toshihiro; Ito, Tadao; and Inui, Keiichiro, 4,797,230, Cl. 252-364.000.
Shiono, Hidemi: *See*—
Matsui, Shigeru; Onodera, Takashi; Sekihara, Kensuke; Shiono, Hidemi; and Kohno, Hideki, 4,797,616, Cl. 324-309.000.
Shionogi & Co., Ltd.: *See*—
Sumimoto, Shinzaburo; Ishizuka, Ichiro; Kai, Hiroyuki; Ueda, Shiro; and Takase, Akira, 4,797,492, Cl. 548-245.000.
Shiotani, Tadahiko; and Matsuura, Hideo, to Sanyei Corp. Ice cream maker. 4,796,440, Cl. 62-343.000.
Shiraishi, Takayoshi, to Hitachi, Ltd. System for enciphering or deciphering data. 4,797,921, Cl. 380-28.000.
Shiratsuchi, Koji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle with favorable air cleaner layout. 4,796,719, Cl. 180-219.000.
Shitori, Yoshiyasu: *See*—
Yoshimura, Shoji; Tani, Yoichiro; Matsuzaki, Youzi; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,797,477, Cl. 536-18.500.
Shoemaker, Jack W. Combined centerline target and grade checker apparatus. 4,796,362, Cl. 33-1.00H.
Shoher, Itzhak; and Whiteman, Aharon E. Metal foil for forming a dental coping. 4,797,100, Cl. 433-222.100.
Shoji, Hisashi: *See*—
Hiratsuka, Seiichiro; Haneda, Satoshi; and Shoji, Hisashi, 4,797,335, Cl. 430-35.000.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kosugi, Seiji; Ando, Norio; and Sagara, Hisao, 4,796,924, Cl. 285-39.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,797,072, Cl. 417-423.200.
Shoup, Gary L.; Coffman, Allen B.; and Fix, Robert L., to Jerr-Dan Corportion. Wheel-lift tow truck. 4,797,057, Cl. 414-563.000.
Showa Denko Kabushiki Kaisha: *See*—
Naitoh, Kazumi; Arakawa, Yoshiaki; and Ikezaki, Takashi, 4,797,789, Cl. 361-525.000.
Shuev, Gennady M.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Shuto, Satoshi; Ito, Hiromichi; Fukukawa, Kiyofumi; Sakakibara, Hideo; and Tsujino, Masatoshi, to Toyo Jozo Kabushiki Kaisha. Nucleoside-phospholipid conjugate. 4,797,479, Cl. 536-27.000.
Shutova, Nadezhda V.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Mushy, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.
Sidam S.R.L.: *See*—
Franco, Grigoli; and Franco, Trabacchi, 4,797,295, Cl. 426-421.000.
Siddoway, Mark A.; Stidham, Neal D.; and Machmer, William C., to Shell Oil Company. Low rank coal by wet oxidizing, drying and cooling. 4,797,136, Cl. 44-501.000.
Siemens Aktiengesellschaft: *See*—
Boy, Juergen, 4,797,778, Cl. 361-130.000.
Goerne, Jan; Kozilek, Joseph; and Moustakas, Steven, 4,797,901, Cl. 375-10.000.
Heumann, Reiner; Noske, Erich; and Rattner, Manfred, 4,796,613, Cl. 128-24.00A.
Keller, Wolfgang, 4,797,525, Cl. 219-10.790.
Koehler, Georg, 4,796,608, Cl. 128-24.00A.
Koelmans, Norbert, 4,797,676, Cl. 342-176.000.
Moser, Thomas; Otto, Klaus; Kippenberg, Horst; Ramler, Johann; and Unterlass, Josef, 4,797,780, Cl. 361-321.000.
Pospischil, Reginhard; Breitfelder, Peter; and Timmermann, Uwe, 4,797,875, Cl. 370-92.000.
Schreiber, Hans, 4,797,611, Cl. 324-208.000.
Sierracin Corporation: *See*—
Nelson, Roger E., 4,797,614, Cl. 324-236.000.
Sigai, A. Gary; and Taubner, Fred R., to GTE Laboratories Incorporated; and GTE Products Corporation. Reprographic aperture lamps having improved maintenance. 4,797,594, Cl. 313-488.000.
SII Megadiamond: *See*—
Peterson, Gary R.; and Horton, M. Duane, 4,797,241, Cl. 264-63.000.
Siligoni, Marco: *See*—
Pasetti, Mauro; and Siligoni, Marco, 4,797,917, Cl. 379-253.000.
Silor Optical of Florida, Inc.: *See*—
Ott, William M., 4,796,756, Cl. 206-454.000.
Simferopolsky Filial Dnepropetrovskogo Inzhenerno-Stroitelnogo Instituta: *See*—
Golovko, Viktor A.; Valts, Semen P.; Lekhno, Alexandr M.; Tetior, Alexandr N.; and Barykin, Boris J., 4,796,398, Cl. 52-169.200.
Simpson, Bobby R. Soil moisture control system and method. 4,796,654, Cl. 137-78.300.

Sinko Kogyo Co., Ltd.: *See*—
Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, 4,796,439, Cl. 62-159.000.

Sira Limited: *See*—
West, Robert N., 4,797,558, Cl. 250-572.000.

Siren, Matti. Inositol triphosphate pharmaceutical compositions. 4,797,390, Cl. 514-103.000.

Sirois, Edmond: *See*—
Bannister, A. Karen; Brandriff, Kristen; Carlotto, John A.; DiDonato, Richard J.; Haigh, Virginia; and Sirois, Edmond, 4,796,443, Cl. 63-14.500.

Siteg Siebtechnik GmbH: *See*—
Lefferts, Johannes, 4,796,749, Cl. 198-851.000.

Sitrin, Robert D.: *See*—
Bowie, Betty A.; Hedde, Richard D.; Lindsey, Thomas O.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,797,280, Cl. 424-118.000.

Sivori, Michel: *See*—
Hanneton, Jean-Jacques; and Sivori, Michel, 4,796,685, Cl. 164-203.000.

Skrobisch, Alfred. Changeable dot display assembly. 4,796,368, Cl. 40-449.000.

Skylite Industry Co., Ltd.: *See*—
Ohashi, Keiichi, 4,797,517, Cl. 200-60.000.

Slater, Roger: *See*—
Schofield, John D.; and Slater, Roger, 4,797,440, Cl. 524-239.000.

Slautterback Corporation: *See*—
Marshall, Lee, 4,796,813, Cl. 239-425.000.

Sloan Valve Company: *See*—
Schmitt, Eugene W., 4,796,731, Cl. 188-196.00D.

Small Brothers U.S.A., Inc.: *See*—
Atkinson, Arthur H.; and Buttolph, David E., 4,796,602, Cl. 126-59.500.

Smanski, Philip J.: *See*—
Gerson, Ira A.; Lindsley, Brett L.; and Smanski, Philip J., 4,797,929, Cl. 381-43.000.

Smayling, Michael C.: *See*—
Verret, Douglas P.; Smayling, Michael C.; Sachdeva, Abnash C.; and Keller, Stephen A., 4,797,372, Cl. 437-034.000.

Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., to Smedberg, Kenneth L. Cushion construction including snubber. 4,796,460, Cl. 72-453.130.

Smeins, Larry G.: *See*—
Chism, Wayne R.; and Smeins, Larry G., 4,797,627, Cl. 330-2.000.

Smethers, Rollo G., Jr., to Lockheed Corporation. Airborne antenna platform. 4,797,680, Cl. 343-705.000.

Smith, Brett A.: *See*—
Ardley, John H.; Smith, Brett A.; and Nicholls, Alison W., 4,797,301, Cl. 427-8.000.

Smith Corona Corporation: *See*—
Duncan, Howard C., IV; Gray, R. William; and Battista, Joseph P., 4,797,855, Cl. 364-900.000.

Smith, David N.: *See*—
Svetkoff, Donald J.; Doss, Brian; and Smith, David N., 4,796,997, Cl. 356-376.000.

Smith, Donald G. Board game apparatus and method. 4,796,894, Cl. 273-244.000.

Smith, Francis M. Carrier for spraycoating auto light covers. 4,796,564, Cl. 118-500.000.

Smith, George D. K.; Hughett, James D.; and Warman, Thomas E., to Ethicon, Inc. Surgical stapler and methods. 4,796,793, Cl. 277-19.000.

Smith, Jeffrey S.: *See*—
Graham, Randall C.; and Smith, Jeffrey S., 4,797,662, Cl. 340-677.000.

Smith, Michael P., to Amoco Corporation. Nondestructive method for analyzing total porosity of thin sections. 4,797,906, Cl. 378-44.000.

Smith, Stanley E.: *See*—
Hoying, John F.; and Smith, Stanley E., 4,796,874, Cl. 267-140.100.

Smith, Ted M., to International Business Machines Corporation. Method and apparatus for positioning electrical components. 4,796,357, Cl. 29-840.000.

Smith, Terrance, to Ampex Corporation. Method and apparatus for controlling the sampling phase of an analog color television signal. 4,797,730, Cl. 358-19.000.

Smith, William N.: *See*—
Symonds, Darrell; King, Kenneth R.; and Smith, William N., 4,796,939, Cl. 294-67.100.

Smithies, Stafford A.; and Atkins, Raymond C., to Gernal Mining Union Corporation Limited. Mining method. 4,796,531, Cl. 102-217.000.

SmithKline Beckman Corporation: *See*—
Bowie, Betty A.; Hedde, Richard D.; Lindsey, Thomas O.; Newman, David J.; Shearer, Marcia C.; Sitrin, Robert D.; and Valenta, Joseph R., 4,797,280, Cl. 424-118.000.

Smiths Industries Public Limited Company: *See*—
Masom, Ronald A., 4,797,006, Cl. 374-130.000.

SMS Hasenclever Maschinenfabrik GmbH: *See*—
Schmoll, Heinz; Schubert, Peter; Schubert, Hans A.; Schulze, Klaus; and Kutz, Heinrich, 4,796,456, Cl. 72-402.000.
Schubert, Peter, 4,796,458, Cl. 72-420.000.

Snow Brand Milk Products Co., Ltd.: *See*—
Hatanaka, Koichi; and Shibauchi, Yoshito, 4,797,255, Cl. 422-28.000.

Snow, Michael G.; Tyler, William R.; Hsu, Sung-Peng; and Fallat, Robert J., to Medical Graphics Corporation. Pulmonary diagnostic system. 4,796,639, Cl. 128-719.000.

Snyder, Blair G. Random number selection device. 4,796,890, Cl. 273-144.00B.

Snyder, William J., to Union Carbide Corporation. Furnace temperature safety system. 4,797,776, Cl. 361-103.000.

Soares, George G.: *See*—
Herrnstadt, Corinna; and Soares, George G., 4,797,276, Cl. 424-84.000.

Societe de Prospection et D'Inventions Techniques (S.P.I.T.): *See*—
Ollivier, Jean; and Barthomeuf, Jean-Paul, 4,797,046, Cl. 411-448.000.

Societe Generale pour les Techniques Nouvelles: *See*—
Aubert, Bruno, 4,797,232, Cl. 252-629.000.

Societe Lorraine de Laminage Continu - Sollac: *See*—
Christiany, Charles, 4,796,665, Cl. 137-614.130.

Societe Nouvelle Des Ateliers Et Chantiers Du Havre: *See*—
Berne, Jean G., 4,796,449, Cl. 72-9.000.

Societe Vynex SA: *See*—
Dechirot, Jean-Pierre, 4,797,819, Cl. 364-403.000.

Soejima, Shigeo: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,797,194, Cl. 204-425.000.

Sofianek, Jay K., to General Motors Corporation. PWM electromagnetic valve with selective case hardening. 4,796,855, Cl. 251-129.150.

Sogabe, Masatoyo: *See*—
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,796,352, Cl. 29-596.000.

Soisson, Lawrence R.: *See*—
Moore, Paul E.; Henderson, Jeffrey S.; Soisson, Lawrence R.; and Toth, Andrew J., 4,797,528, Cl. 219-70.000.

Solid State Systems, Inc.: *See*—
Ratcliff, Reginald, 4,797,876, Cl. 370-62.000.

Soliman, Mohamed Y.: *See*—
Petak, Kevin R.; Soliman, Mohamed Y.; and Anderson, Merlin F., 4,797,821, Cl. 364-422.000.

Soma, Koroku; Watanabe, Noritsugu; and Taniguro, Wataru, to Pasco Corporation. Method for mobile survey of road surface. 4,796,998, Cl. 356-376.000.

Sommers, Steven F.: *See*—
Dombrowski, Anthony E., 4,797,673, Cl. 340-904.000.

Son, Pyong-Nae: *See*—
Kletecka, George; Lai, John T.; and Son, Pyong-Nae, 4,797,438, Cl. 524-100.000.

Sonder, Gerhard: *See*—
Knapp, Malcolm H.; and Sonder, Gerhard, 4,796,721, Cl. 180-294.000.

Sonobe, Hisao; Makino, Junichi; Oho, Shigeru; Matsumoto, Masahiro; Kitano, Kouji; and Araki, Hiroshi, to Hitachi, Ltd. Phase modulation type fiber optic gyroscope. 4,796,993, Cl. 356-350.000.

Sonobe, Yoshiho: *See*—
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.

Sonoda, Takefumi, to Ube Industries, Ltd. Injection molding press. 4,797,245, Cl. 264-328.400.

Sony Corporation: *See*—
Nishiguchi, Masayuki; and Akagiri, Kenzo, 4,797,902, Cl. 375-27.000.
Takahasi, Kenji, 4,797,770, Cl. 369-291.000.

Sood, Lal C.: *See*—
Wang, Karl L.; and Sood, Lal C., 4,797,858, Cl. 365-230.000.

Sorbi, Robert T.; Caretta, Antonio; Cavaggioni, Andrea; and Marchesi Gastaldi, Liliana, to Universita Degli Studi di Parma. New biologically active fluorescent cyclic nucleotides. 4,797,480, Cl. 536-27.000.

Southard, Robert K.: *See*—
Marzari, Robert L.; Southard, Robert K.; and Stape, William J., 4,797,556, Cl. 250-551.000.

Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Internally modified ceramic fiber. 4,797,378, Cl. 501-95.000.

Spangle, Lloyd B., to Dowell Schlumberger Incorporated. Expandable cement composition. 4,797,159, Cl. 106-89.000.

Spangler, Richard: *See*—
Gant, Eugene; and Spangler, Richard, 4,796,900, Cl. 279-123.000.

Spazierer, Hubert; and Weber, Adam, to SWF Auto-Electric GmbH. Switch, especially for motor vehicles. 4,797,520, Cl. 200-295.000.

Speaker, Tully J.; Speaker, Tycho J.; and Collett, John H., to Temple University. Production of sustained release composition from salt-form reactants. 4,797,234, Cl. 264-4.100.

Speaker, Tycho J.: *See*—
Speaker, Tully J.; Speaker, Tycho J.; and Collett, John H., 4,797,234, Cl. 264-4.100.

Specht, Martin: *See*—
Meyer, Rudolph; and Specht, Martin, 4,796,918, Cl. 280-806.000.

Spector, George: *See*—
Davis, Charles L.; and Spector, George, 4,796,302, Cl. 2-21.000.
Goss, Ray J.; and Spector, George, 4,796,791, Cl. 224-275.000.

Spectra Physics, Inc.: *See*—
Honganen, Ronald E.; Howe, Robert L.; and Miller, Leslie A., 4,797,207, Cl. 210-198.200.

Spetsialnoe Konstruktorskoe Bjuro Gidroimpulsnoi Tekhniki: *See*—
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobko, Vladlen V.; Kulagin, Rim A.; and Ernilov, Nikolai P., 4,796,956, Cl. 299-69.000.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of perylene-3,4,9,10-tetracarboxylic acid

N,N'-dimethylimide in a high-hiding pigmentary form. 4,797,162, Cl. 106-498.000.

Spinner, Samuel: *See—*
Bernstein, Joel; and Spinner, Samuel, 4,797,684, Cl. 343-895.000.

Spinnler, Fritz: *See—*
El-Nashar, Ibrahim; Jaussi, Francois; Kirchhofer, Hubert; Komauer, Christian; Mayer, Andreas; Perevuznik, Josef; and Spinnler, Fritz, 4,796,595, Cl. 123-559.200.

Spirk, John W.; Nottingham, John R.; and Kalman, Jeffrey M., to G & S Metal Product Company, Inc. Soft ice cream dispenser. 4,796,784, Cl. 222-80.000.

Spitzmesser, Donovan J.: *See—*
MacDoran, Peter F.; and Spitzmesser, Donovan J., 4,797,677, Cl. 342-352.000.

Spotka, Rudolf: *See—*
Hofmann, Norbert; and Spotka, Rudolf, 4,797,018, Cl. 400-249.000.

Spruill, John C.: *See—*
Evans, David N.; Fairchild, Charles L.; Kramer, Karl C.; Spruill, John C.; Wansor, Gerard J.; and Wood, Robert W., 4,797,293, Cl. 426-330.300.

Square D Company: *See—*
Clark, Michael R.; Kuipper, Gerald J.; Monson, Donald B.; and Tringali, Dominick, 4,797,516, Cl. 200-51.00R.

Srinivasan, Vijay: *See—*
Nackman, Lee R.; and Srinivasan, Vijay, 4,797,842, Cl. 364-578.000.

Stabinsky, Yitzhak, to Amgen Inc. Methods for attaching polynucleotides to supports. 4,797,355, Cl. 435-6.000.

Stack, Gary P.; Golobish, Thomas D.; and Abou-Gharbia, Magid A., to American Home Products Corporation. Psychotropic polycyclic imides. 4,797,488, Cl. 544-295.000.

Stack, Gary P.: *See—*
Abou-Gharbia, Magid A.; Stack, Gary P.; and Yardley, John P., 4,797,489, Cl. 544-331.000.

Stadelmann, Ludwig: *See—*
Bauer, Hans-Peter; Bauer, Hans J.; Stadelmann, Ludwig; and Frisch, Emil, 4,796,871, Cl. 267-64.110.

Stahlecker, Fritz; and Stahlecker, Hans. Arrangement for open-end rotor spinning. 4,796,421, Cl. 57-417.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,796,421, Cl. 57-417.000.

Stahr, Fritz: *See—*
Grimm, Stefan; Schatzle, Michael; and Stahr, Fritz, 4,797,463, Cl. 528-60.000.

Stallion Trailer Kits, Inc.: *See—*
Wilson, James E., 4,796,864, Cl. 254-425.000.

Stamatoff, James B.: *See—*
Leslie, Thomas M.; Yoon, Hyun-Nam; DeMartino, Ronald N.; and Stamatoff, James B., 4,796,976, Cl. 350-330.000.

Stamper, John W. Quick release joints and structures incorporating same. 4,797,021, Cl. 403-407.100.

Stancil, Daniel D. Optical frequency shifter using magnetostatic waves. 4,796,983, Cl. 350-376.000.

Standard Havens, Inc.: *See—*
Heap, Ronald E., 4,797,002, Cl. 366-25.000.

Standard Oil Company, The: *See—*
Bartek, Joseph P.; and Guttmann, Andrew T., 4,797,381, Cl. 502-202.000.

Stanley, Thomas R., to Teepak, Inc. Constricting and fastening apparatus. 4,796,332, Cl. 17-34.000.

Stano, Robert R.; and Harrington, Richard H., to Stano, Robert R. Race stopwatch with plural displays and operating modes. 4,797,864, Cl. 368-111.000.

Stape, William J.: *See—*
Marzari, Robert L.; Southard, Robert K.; and Stape, William J., 4,797,556, Cl. 250-551.000.

Starr, Urban, Sr. Auxiliary suspension system for a motor vehicle. 4,796,910, Cl. 280-715.000.

Staudt, Heinrich: *See—*
Helbig, Michael; and Staudt, Heinrich, 4,797,008, Cl. 384-49.000.

Stauffer Chemical Co.: *See—*
Baker, Don R.; Brownell, Keith H.; and Kezerian, Charles, 4,797,416, Cl. 514-485.000.
Carter, Charles G., 4,797,150, Cl. 71-103.000.
Lee, David L.; and Carter, Charles G., 4,797,147, Cl. 71-92.000.

Steckis, Al. Deflashing apparatus. 4,796,388, Cl. 51-164.100.

Steed, Jeffrey A.; Ruhl, Walter F.; and Weaver, James M., to Lambert Corporation. Rear dumping lawn sweeper with folding wind apron. 4,796,322, Cl. 15-79.00A.

Steel, Duncan G.; and Turley, R. Steven, to Hughes Aircraft Company. Apparatus and method for locating the direction of an atomic beam. 4,797,552, Cl. 250-251.000.

Steenbeck, Ulf: *See—*
Bohn, Gerhard; Steinmetz, Guenter; and Steenbeck, Ulf, 4,796,724, Cl. 181-106.000.

Stefanek, Ronald T.: *See—*
Richards, James A.; and Stefanek, Ronald T., 4,797,779, Cl. 361-154.000.

Stein, Theodore, to MasterCard International, Inc. Electronic funds transfer system with means for verifying a personal identification number without pre-established secret keys. 4,797,920, Cl. 380-24.000.

Steinbeck, Karl: *See—*
Knobs, Hans-Joachim; Steinbeck, Karl; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,797,412, Cl. 514-383.000.

Steinberg, David H.; and Cortolano, Frank, to Ciba-Geigy Corporation. Stabilizer thiirane derivatives containing hindered phenol groups. 4,797,218, Cl. 252-47.500.

Steinmetz, Guenter: *See—*
Bohn, Gerhard; Steinmetz, Guenter; and Steenbeck, Ulf, 4,796,724, Cl. 181-106.000.

Stemniski, John R.: *See—*
Coccoli, Joseph D.; Stemniski, John R.; and Cardarelli, Donato, 4,796,968, Cl. 350-96.150.

Stenzel, Otto; and Thomas, Friedrich-Werner, to Leybold Aktiengesellschaft. Apparatus for controlling the distance of a melting electrode from the surface of the melted material in a vacuum arc furnace. 4,797,897, Cl. 373-105.000.

Sternhagen, David A., to D & H Bowling Supply, Inc. Bowling lane gutter. 4,796,887, Cl. 273-51.000.

Sterzel, Hans-Josef: *See—*
Portugall, Michael; Blinne, Gerd; and Sterzel, Hans-Josef, 4,797,465, Cl. 528-176.000.

Stettler, Friedrich. Security closure lid and container provided with such lid. 4,796,771, Cl. 215-253.000.

Stettler, Robert H.: *See—*
Hurley, James E.; and Stettler, Robert H., 4,796,600, Cl. 126-273.00H.

Stevenson, Hildreth W.: *See—*
Roemke, Lowell W.; and Stevenson, Hildreth W., 4,797,306, Cl. 427-261.000.

Stewart, David A.: *See—*
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,797,180, Cl. 204-1.00T.

Stewart, William: *See—*
Forrest, John; Stewart, William; and Tulloch, Rory, 4,796,704, Cl. 166-317.000.

Stibal, Terry L. Reed holding device. 4,796,507, Cl. 84-383.00A.

Sticher, Otto: *See—*
Nyiredy, Szabolcs; Erdelmeier, Clemens; and Sticher, Otto, 4,797,215, Cl. 210-658.000.

Stichting Voor De Technische Wetenschappen: *See—*
Brakenhoff, Godefridus J., 4,796,974, Cl. 350-247.000.

Stidham, Neal D.: *See—*
Siddoway, Mark A.; Stidham, Neal D.; and Machmer, William C., 4,797,136, Cl. 44-501.000.

Stiglmaier, Manfred: *See—*
Hagin, Faust; Seethaler, Franz; Zelinka, Robert; and Stiglmaier, Manfred, 4,796,488, Cl. 74-713.000.

Stikvoort, Eduard F., to U.S. Philips Corporation. Phase-locked loop coefficient generator for a filter arrangement having a non-rational ratio between input and output sampling frequencies. 4,797,845, Cl. 364-724.100.

Stinson, John L., Jr.; and Henley, George W., Jr., to Easy Shucker, Inc. Shellfish shucking machine. 4,796,333, Cl. 17-76.000.

Stites, George M., III, to G. M. Holding Corp. Supervisory control of mobile telecommunications. 4,797,949, Cl. 455-230.000.

Stocton, Paul M.; Greive, Michael; and Glocker, Raymond, to Glocker und Greive GmbH. Device for heating or cooling infusion fluids or injectable fluids. 4,796,696, Cl. 165-169.000.

Stolk, Richard D.; and Bekker, Vladimir O., to Monsanto Company. Non-metallic polymeric twist tie. 4,797,313, Cl. 428-156.000.

Stomberg, David E.: *See—*
Kanengieter, Glenn G.; and Stomberg, David E., 4,796,728, Cl. 188-18.00A.

Stowers, Julian L.: *See—*
Conine, James W.; and Stowers, Julian L., 4,797,405, Cl. 514-288.000.

Straubel, Max: *See—*
Hofer, Gerald; Laufer, Helmut; and Straubel, Max, 4,796,592, Cl. 123-502.000.

Streebin, Leale E.: *See—*
Hendershot, John A.; and Streebin, Leale E., 4,796,676, Cl. 141-83.000.

Streeter, Edward C. Link suspension for a rotor member. 4,797,591, Cl. 310-103.000.

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Bozhko, Valery P.; Losev, Alexei V.; Strizhenko, Vitaly; Pleshkov, Viktor I.; and Levityansky, Ivan A., 4,796,868, Cl. 266-51.000.

Strizhenko, Vitaly E.: *See—*
Bozhko, Valery P.; Yatsenko, Sergei V.; Strizhenko, Vitaly E.; Losev, Alexei V.; Pleshkov, Viktor I.; and Junash, Viktor M., 4,796,867, Cl. 266-51.000.

Strobel, Charles W.: *See—*
Katchko, John E.; Strobel, Charles W.; and Plaisance, Thomas H., 4,797,176, Cl. 162-135.000.

Strobert, Samuel S.: *See—*
Mastromoro, John F.; French, Richard W.; and Strobert, Samuel S., 4,797,909, Cl. 379-67.000.

Stromberg, Karl-Otto. Turbine wheel having hub-mounted elastically deformable blade made of reinforced polymeric composite material. 4,797,066, Cl. 416-230.000.

Stroy, Gary H.: *See—*
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,797,283, Cl. 424-443.000.

Strunkmann-Meister, Karl E. Vessel. 4,796,757, Cl. 206-509.000.

Struntz, Bernard J. Fishing rod with improved handgrip. 4,796,373, Cl. 43-23.000.

Stuckey, William C. Lockable closure cap. 4,796,768, Cl. 215-207.000.

Studinka, Josef: *See*—
Kirchmayr, Karl; Miko, Hans-Jurgen; Watzka, Bruno; Studinka, Josef; and Schmitt-Henco, Carl, 4,797,161, Cl. 106-98.000.

Sturdevan, Ronald P.; and Pickelhaupt, Alexander J., to Prestolite Wire Corporation. Angled boot for angled spark plug cable terminals. 4,797,115, Cl. 439-125.000.

Sueda, Tetsuo: *See*—
Honda, Mitsuru; Sueda, Tetsuo; Mursi, Keiichi; and Ogawa, Kyosuke, 4,797,327, Cl. 428-600.000.

Suegara, Nobuo: *See*—
Kawai, Yasuo; Yazawa, Kazunaga; Suegara, Nobuo; and Shimohashi, Hirotaka, 4,797,278, Cl. 424-93.000.

Sugano, Mitugu; Kaneko, Shinichi; Oka, Mitsunori; Nokina, Kimiya; and Koshimizu, Kazuhiro, to Hitachi, Ltd.; and Hitachi Electronics Eng. Co., Ltd. Method for writing servo pattern in magnetic disk unit. 4,797,754, Cl. 360-48.000.

Sugimori, Shigeru: *See*—
Goto, Yasuyuki; Sugimori, Shigeru; and Ogawa, Tetsuya, 4,797,228, Cl. 252-299.630.

Sugishima, Kiyohisa; and Yamada, Masanori, to Canon Kabushiki Kaisha. Multi-unit image processing system with central control. 4,797,706, Cl. 355-14.00R.

Sugita, Tunezo, to Konishiroku Photo Industry Co., Ltd. Continuous coating method capable of achieving higher yield. 4,797,304, Cl. 427-208.600.

Sugiyama, Fumio; and Dachiku, Kenshi, to Kabushiki Kaisha Toshiba. Divisional image transmission system and method. 4,797,742, Cl. 358-141.000.

Sugiyama, Hiroshi; Fujiwara, Mikio; and Ikeda, Chikamasa, to Ikeda Bussan Co. Ltd. Automatic headrest positioning apparatus for seat of motor vehicles. 4,797,824, Cl. 364-424.050.

Sujdak, Richard J.: *See*—
Merrell, Gene A.; and Sujdak, Richard J., 4,796,548, Cl. 110-343.000.

Sukuzi, Kenji: *See*—
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, 4,797,400, Cl. 514-255.000.

Sullivan, Patrick F. Spray-suppressant surface configuration. 4,796,905, Cl. 280-154.50R.

Sullivan, Patrick F. Spray-suppressant surface configuration. 4,796,906, Cl. 280-154.50R.

Sumimoto, Shinzaburo; Ishizuka, Ichiro; Kai, Hiroyuki; Ueda, Shiro; and Takase, Akira, to Shionogi & Co., Ltd. Polyfluoroalkylisoxazolylamines. 4,797,492, Cl. 548-245.000.

Sumioka, Tsutomu: *See*—
Sasada, Shigeru; Yamamoto, Masahiro; Shimizu, Yoshio; and Sumioka, Tsutomu, 4,797,711, Cl. 355-32.000.

Sumitomo Chemical Company, Limited: *See*—
Inoue, Yasuhiko; Matsuda, Masaaki; and Akiyoshi, Yoshirou, 4,797,264, Cl. 423-7.000.
Kadokura, Hidekimi; Sawara, Kenichi; and Yako, Tadaaki, 4,797,500, Cl. 556-1.000.

Sumitomo Electric Industries, Ltd.: *See*—
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, 4,797,143, Cl. 65-3.120.
Sato, Koji; Kurakake, Masahiro; and Fujiwaki, Kazuo, 4,797,940, Cl. 382-9.000.

Sumitomo Heavy Industries Ltd: *See*—
Adachi, Taira, 4,797,086, Cl. 425-589.000.

Sumitomo Metal Industries Ltd.: *See*—
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, 4,796,798, Cl. 228-146.000.

Sun, Anthony M.: *See*—
Parisius, John W.; and Sun, Anthony M., 4,797,213, Cl. 210-651.000.

Sun, Ko-Lin. Method and fittings enabling articles to be rapidly taken into and out of a case. 4,796,407, Cl. 53-390.000.

Sunagawa, Hiroshi; and Kamiyama, Kozi, to Fuji Photo Film Co., Ltd. Pick-up head for optical information storage disk. 4,797,867, Cl. 369-45.000.

Sundberg, Carl-Erik: *See*—
Habbab, Isam M. I.; Kavehrad, Mohsen; and Sundberg, Carl-Erik, 4,797,879, Cl. 370-3.000.

Sundstrand Corporation: *See*—
Capion, Robert L., 4,797,588, Cl. 310-54.000.
Ng, Chai-Nam; and Dhyanchand, John J., 4,797,802, Cl. 363-87.000.
Raad, Bernard A.; and Schott, Edmund A., 4,797,590, Cl. 310-68.00D.

Sundstrand Data Control, Inc.: *See*—
Peters, Rex B., 4,797,822, Cl. 364-422.000.

Sunnen Products Company: *See*—
Rutter, Harold T.; and Ondrus, Joseph F., 4,796,363, Cl. 33-164.00R.

Sunter, Stephen K., to Northern Telecom Limited. Current-mirror-biased pre-charged logic circuit. 4,797,580, Cl. 307-451.000.

Sunwell Engineering Company Limited: *See*—
Goldstein, Vladimir, 4,796,441, Cl. 62-354.000.

Susaki, Wataru: *See*—
Kokubo, Yoshihiro; and Susaki, Wataru, 4,797,895, Cl. 372-43.000.

Suto, Mark J.; and Werbel, Leslie M., to Warner-Lambert Company. 2-nitroimidazole derivatives useful as radiosensitizers for hypoxic tumor cells. 4,797,397, Cl. 514-212.000.

Sutovsky, Pavel M.: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.

Sutton Energy Corporation: *See*—
Sutton, Robert C., 4,797,137, Cl. 44-639.000.

Sutton, Robert C., to Sutton Energy Corporation. Apparatus for cleaning fossil fuel, such as coal and crude oil. 4,797,137, Cl. 44-639.000.

Suyama, Eizo: *See*—
Ikuta, Shiro; Suyama, Eizo; Yokoyama, Masaru; and Yoshimura, Takeshi, 4,796,694, Cl. 165-152.000.

Suzaki, Yukihiko: *See*—
Tanaka, Akira; Nagao, Akira; Suzaki, Yukihiko; Yamada, Hideji; Nakajima, Toyohei; and Mieno, Toshiyuki, 4,796,586, Cl. 123-425.000.

Suzuki, Kazuo: *See*—
Waki, Tatsuo; Watanabe, Takeshi; and Suzuki, Kazuo, 4,797,426, Cl. 521-93.000.

Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,797,768, Cl. 360-132.000.

Suzuki, Yasuo: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Koizumi, Minoru; Kawano, Katsumi; Kasajima, Hirokazu; and Nakai, Kozo, 4,797,885, Cl. 371-19.000.

Suzuki, Yoshio; and Yukihiko, Suzaki, to Honda Giken Kogyo Kabushiki Kaisha. Electronic control system for internal combustion engines. 4,797,828, Cl. 364-431.040.

Suzuki, Yoshito, to Hitachi, Ltd. Data transfer control equipment. 4,797,851, Cl. 364-900.000.

Suzuki, Yoshiyuki; Funada, Masahiro; Sato, Mamoru; and Sato, Yukio, to Canon Kabushiki Kaisha. Image data coding apparatus. 4,797,945, Cl. 382-56.000.

Svetkoff, Donald J.; Doss, Brian; and Smith, David N., to Synthetic Vision Systems, Inc. Method and system for high-speed, 3-D imaging of an object at a vision station. 4,796,997, Cl. 356-376.000.

Swann, Peter R.; and Jones, Joseph S., to Gatan Inc. Multiple specimen cryotransfer holder for electron microscopes. 4,797,261, Cl. 422-102.000.

Sweeney, Kevin L.: *See*—
Lukas, Gregory J.; Sweeney, Kevin L.; and Keur, Michael R., 4,796,975, Cl. 350-320.000.

Sweeney, Ronald M.: *See*—
Rimmer, James R.; and Sweeney, Ronald M., 4,796,409, Cl. 53-438.000.

SWF Auto-Electric GmbH: *See*—
Spazierer, Hubert; and Weber, Adam, 4,797,520, Cl. 200-295.000.

Swiss Aluminium Ltd.: *See*—
Weber, Jean-Claude, 4,796,689, Cl. 164-503.000.

Swiss Aluminum Ltd.: *See*—
Hollrigl, Gunter; and Rodrigues, Pedro, 4,797,164, Cl. 148-2.000.

Switchcraft, Inc.: *See*—
Lau, Frederick L., 4,797,114, Cl. 439-79.000.

Symonds, Darrell; King, Kenneth R.; and Smith, William N., to CorSling, Inc. Lifting means. 4,796,939, Cl. 294-67.100.

Synthetic Vision Systems, Inc.: *See*—
Svetkoff, Donald J.; Doss, Brian; and Smith, David N., 4,796,997, Cl. 356-376.000.

Sytek, Inc.: *See*—
Ben-Artzi, Amatzia, 4,797,881, Cl. 370-88.000.

Szabo , Jozsef: *See*—
Szucs, Laszlo ; and Szabo , Jozsef, 4,796,692, Cl. 165-129.000.

Szlam, Aleksander; Crooks, James W., Jr.; and Marks, Curtis G., to Inventions, Inc. Customer account online servicing system. 4,797,911, Cl. 379-67.000.

Szucs, Laszlo ; and Szabo , Jozsef, to Energiagazdalkodasi Intezet. Convector with finned tubes. 4,796,692, Cl. 165-129.000.

Szyszlican, Eduardo D.: *See*—
Honda, Hiroshi; and Szyszlican, Eduardo D., 4,797,626, Cl. 328-225.000.

T. D. Williamson, Inc.: *See*—
Cho, Hyun J., 4,797,239, Cl. 264-45.500.

T and G. Corporation: *See*—
Peck, Robert L., 4,797,190, Cl. 204-296.000.

TA Triumph-Adler Aktiengesellschaft: *See*—
Hofmann, Norbert; and Spotka, Rudolf, 4,797,018, Cl. 400-249.000.

Tachi-S Ltd.: *See*—
Saito, Tetsuo, 4,796,954, Cl. 297-452.000.

Tada, Eiichi: *See*—
Saji, Yoshiro; and Tada, Eiichi, 4,797,646, Cl. 335-301.000.

Taft, David. Combination screw-tapping and screwdriving tool. 4,796,319, Cl. 7-158.000.

Tagawa, Yuji: *See*—
Tamura, Hisao; Tokumitsu, Shuichi; and Tagawa, Yuji, 4,796,951, Cl. 297-337.000.

Taiho Pharmaceutical Company Limited: *See*—
Fujii, Setsuro; Ogawa, Kazuo; Hamakawa, Toshihiro; and Muranaka, Yoshiyuki, 4,797,502, Cl. 558-52.000.

Taisei Corporation: *See*—
Ueda, Kouhei, 4,796,673, Cl. 138-97.000.

Tajima, Joji, to NEC Corporation. Apparatus for identifying postage stamps. 4,797,937, Cl. 382-1.000.

Tajima, Sigeru: *See*—
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, 4,797,400, Cl. 514-255.000.

Tajiri, Hiromitsu; Nishiguchi, Yasuo; and Matsuyama, Chiaki, to Kyocera Corporation. Reading apparatus with improved performance. 4,797,561, Cl. 250-578.000.
Takabayashi, Seiichiro: *See*—
Kunimoto, Akihiro; Takabayashi, Seiichiro; and Matsui, Yuji, 4,797,307, Cl. 427-386.000.
Takagi, Akira: *See*—
Chikamasa, Hiroshi; Takagi, Akira; and Sakaguchi, Masaaki, 4,796,824, Cl. 242-76.000.
Takagi, Yasushi; and Murakami, Toshio, to Hitachi, Ltd. White balance adjusting device for a color video camera. 4,797,733, Cl. 358-29.000.
Takahashi, Kazuo, to Fuji Photo Film Co., Ltd. Processing head for electrophotographic apparatus. 4,797,644, Cl. 355-10.000.
Takahashi, Koji: *See*—
Sato, Chikara; Nakayama, Tadayoshi; Takahashi, Koji; and Sasatani, Tomohiko, 4,797,741, Cl. 358-138.000.
Takahashi, Osamu; Ogawa, Tadashi; Sakai, Minoru; and Toriuchi, Masaharu, to Fuji Photo Film Co., Ltd. Method for forming a color image comprising developing a light sensitive material containing a surfactant with a developer not containing benzyl alcohol. 4,797,349, Cl. 430-372.000.
Takahashi, Shingo: *See*—
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,796,978, Cl. 350-337.000.
Takahashi, Tohru: *See*—
Kuroki, Junsuke; Takahashi, Tohru; and Ito, Ken, 4,796,911, Cl. 280-689.000.
Takahashi, Tomoaki: *See*—
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,796,978, Cl. 350-337.000.
Takahasi, Kenji, to Sony Corporation. Disk cartridge with releasable latching shutter. 4,797,770, Cl. 369-291.000.
Takai, Haruki: *See*—
Tsuji, Akira; and Takai, Haruki, 4,797,678, Cl. 342-352.000.
Takai, Hitoshi; and Morotomi, Noriaki, to Matsushita Electric Industrial Co., Ltd. Distortion surveillance apparatus for television signal transmission system. 4,797,735, Cl. 358-86.000.
Takano, Sakuharu: *See*—
Katsuta, Yuji; Kita, Sumio; Takano, Sakuharu; and Kamada, Hiroshi, 4,797,946, Cl. 382-61.000.
Takano, Yasuo; Tokoro, Hiroyoshi; Kobayashi, Junji; Yamada, Masato; Harada, Toshimitsu; and Hosoya, Kensei, to Hitachi Koki Company, Limited. Electrophotographic developing device having a shaped doctor board. 4,796,561, Cl. 118-657.000.
Takao, Mitsunori: *See*—
Kiyono, Masashi; Abe, Tomoaki; and Takao, Mitsunori, 4,796,591, Cl. 123-492.000.
Takase, Akira: *See*—
Sumimoto, Shinzaburo; Ishizuka, Ichiro; Kai, Hiroyuki; Ueda, Shiro; and Takase, Akira, 4,797,492, Cl. 548-245.000.
Takase, Haruo: *See*—
Uenaka, Kazushige; Takase, Haruo; Utomo, Riuzi; and Akimoto, Masuo, 4,797,698, Cl. 354-275.000.
Takayama, Makoto, to Canon Kabushiki Kaisha. DPCM encoder. 4,797,653, Cl. 341-51.000.
Takeda Chemical Industries, Ltd.: *See*—
Miyake, Akio; Yoshimura, Yoshinobu; and Numata, Mitsuo, 4,797,395, Cl. 514-206.000.
Nakayama, Takeo; Inoue, Saburo; and Sakamoto, Takurou, 4,797,449, Cl. 525-217.000.
Takeda, Hideo: *See*—
Shibata, Norio; Sato, Tsunehiko; Takeda, Hideo; and Chino, Naoyoshi, 4,796,557, Cl. 118-62.000.
Takei, Toshihiro: *See*—
Wakata, Hideo; Imoto, Yuzo; Takei, Toshihiro; and Hattori, Yoshiyuki, 4,796,957, Cl. 303-116.000.
Takenaka Komuten Co., Ltd.: *See*—
Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, 4,796,439, Cl. 62-159.000.
Takeuchi, Keiji; Nishino, Takashi; Odera, Motoyasu; Shimogaki, Hisao; and Negi, Tahee, to Lion Corporation. Alkaline proteases and microorganisms producing same. 4,797,362, Cl. 435-221.000.
Takeuchi, Toshitaka. Tremolo arm adjustment mechanism in electric guitar. 4,796,505, Cl. 84-313.000.
Takezoe, Akinobu: *See*—
Nakako, Takefumi; Inoue, Shoji; and Takezoe, Akinobu, 4,796,797, Cl. 228-144.000.
Takiguchi, Toshio, to Kabushiki Kaisha Toshiba. Ion selective electrode apparatus with an earth electrode. 4,797,192, Cl. 204-412.000.
Takiguchi, Yoshihiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Streak camera device having a plurality of streak tubes. 4,797,747, Cl. 358-217.000.
Takikawa, Kazunori: *See*—
Ono, Yuichi; and Takikawa, Kazunori, 4,796,571, Cl. 123-41.120.
Takita, Masaaki; Tsuru, Yoshikazu; Ushihara, Masaharu; Itoh, Taichi; and Tanaka, Masumi, to Matsushita Electric Industrial Co., Ltd. Ribbon feed mechanism. 4,797,690, Cl. 346-105.000.
Talmage, John E., Jr.; and Gibson, William A., to Elographics, Inc. Touch sensitive device with increased linearity. 4,797,514, Cl. 178-18.000.
Tam, Simon M.: *See*—
Lee, Winston K. M.; Oto, Duane H.; and Tam, Simon M., 4,797,856, Cl. 365-185.000.
Tamai, Shoji: *See*—
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshibo; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.
Tamary, Ernest J., to Eastman Kodak Company. Skive with anti-gouge stiffener. 4,796,880, Cl. 271-311.000.
Tame, Omar D., to Hoover Universal, Inc. Remote release and pull-down unit. 4,796,932, Cl. 292-112.000.
Tamitani, Ichiro: *See*—
Harasaki, Hidenobu; Tamitani, Ichiro; and Endo, Yukio, 4,797,740, Cl. 358-136.000.
Tamura, Hisao; Tokumitsu, Shuichi; and Tagawa, Yuji, to Ikeda Bussan Co., Ltd. Automotive seat. 4,796,951, Cl. 297-337.000.
Tanaka, Akira; Nagao, Akira; Suzaki, Yukihiko; Yamada, Hideji; Nakajima, Toyohei; and Mieno, Toshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for controlling ignition timing in internal combustion engine. 4,796,586, Cl. 123-425.000.
Tanaka, Fujio, to Pioneer Electronic Corporation. Speaker system with independently supported top plate. 4,797,935, Cl. 381-205.000.
Tanaka, Kazuhiko, to Nippon Thompson Co., Ltd. Linear motion rolling guide unit. 4,797,012, Cl. 384-45.000.
Tanaka Kikinzoku Kogyo K.K.: *See*—
Motoo, Satoshi; and Watanabe, Masahiro, 4,797,380, Cl. 502-159.000.
Tanaka, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; Murofushi, Toshiaki; and Kimura, Takaaki, to Fuji Xerox Co., Ltd. Dry electrophotographic toner comprising graft copolymer. 4,797,340, Cl. 430-109.000.
Tanaka, Masumi: *See*—
Takita, Masaaki; Tsuru, Yoshikazu; Ushihara, Masaharu; Itoh, Taichi; and Tanaka, Masumi, 4,797,690, Cl. 346-105.000.
Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Method of compressing and reconstructing image signals by vector quantization. 4,797,739, Cl. 358-133.000.
Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Image signal encoding method by orthogonal transformation. 4,797,944, Cl. 382-56.000.
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, to Seikosha Co., Ltd. Projection type liquid crystal displaying device. 4,796,978, Cl. 350-337.000.
Tanaka, Shigeru; and Ishiyama, Fumio, to Kabushiki Kaisha Toshiba. Voltage-resonance type power supply circuit for X-ray tube. 4,797,908, Cl. 378-105.000.
Tanaka, Shinji: *See*—
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.
Tanaka, Toshio; Hazato, Atsuo; and Kurozumi, Seizi, to Teijin Limited. 6-substituted prostagiandins E_1 and process for producing same. 4,797,506, Cl. 560-121.000.
Tange, Toyokichi: *See*—
Maruyama, Masatoshi; Hasegawa, Yukinobu; and Tange, Toyokichi, 4,797,339, Cl. 430-109.000.
Tani, Yoichiro: *See*—
Yoshimura, Shoji; Tani, Yoichiro; Matsuzaki, Youzi; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,797,477, Cl. 536-18.500.
Taniguchi, Mitsuyoshi: *See*—
Ohta, Takeshi; Kamiya, Yoji; Nakashima, Kunimichi; and Taniguchi, Mitsuyoshi, 4,797,052, Cl. 414-744.300.
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Flash photographing system. 4,797,702, Cl. 354-413.000.
Taniguro, Wataru: *See*—
Soma, Koroku; Watanabe, Noritsugu; and Taniguro, Wataru, 4,796,998, Cl. 356-376.000.
Tarbox, Gary L.: *See*—
Huntsman, Lee L.; Leard, Richard S.; Tarbox, Gary L.; Barnes, Stephen R.; and McLaren, Barry D., 4,796,634, Cl. 128-662.010.
Tarnawskyj, Ihor W.: *See*—
Law, Kock-Yee; and Tarnawskyj, Ihor W., 4,797,337, Cl. 430-58.000.
Tarsio, Joseph F.; and Furcht, Leo T., to University of Minnesota, Regents of the. Monoclonal antibodies to unreduced, nonenzymatically-glycated proteins. 4,797,473, Cl. 530-387.000.
Taschner, Wolfgang: *See*—
Habig, Klaus; Taschner, Wolfgang; and Wolfle, Wilfried, 4,796,778, Cl. 220-315.000.
Tau Laboratories, Inc.: *See*—
Gordon, Joseph, 4,796,973, Cl. 350-1.100.
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; and Schlemmer, Lothar, to BASF Aktiengesellschaft. Graft polymers of polyphenylene ethers. 4,797,453, Cl. 525-397.000.
Taubner, Fred R.: *See*—
Sigai, A. Gary; and Taubner, Fred R., 4,797,594, Cl. 313-488.000.
Tawada, Yoshihisa: *See*—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,797,527, Cl. 219-69.00E.
Taylor, John N.: *See*—
Dalquist, H. David; Jorgensen, Jorgen A.; Keleny, Lloyd G.; Nygren, Donald W.; and Taylor, John N., 4,796,776, Cl. 220-203.000.
Taylor, Paul D.: *See*—
De Thomas, Waldo; and Taylor, Paul D., 4,797,382, Cl. 502-245.000.
TDK Corporation: *See*—
Ezaki, Joichiro; and Kanai, Hiroshi, 4,797,765, Cl. 360-110.000.
Fujii, Tatsuo, 4,796,753, Cl. 206-387.000.

TEAC Corporation: *See*—
Nagai, Tadao; and Sato, Kenichi, 4,797,870, Cl. 369-100.000.
Technoplas, Inc.: *See*—
Kojima, Hisashi, 4,797,236, Cl. 264-40.100.
Tecnodelta S.A.: *See*—
Mantovani, Elis, 4,796,353, Cl. 29-596.000.
Teepak, Inc.: *See*—
Stanley, Thomas R., 4,796,332, Cl. 17-34.000.
Teetz, Volker; Henke, Stephan; Brocks, Dietrich; Hanauske-Abel, Hartmut; and Gunzler, Volkmar, to Hoechst Aktiengesellschaft. Peptide derivatives having an inhibitory action on hydroxylating enzymes, a process for their preparation, agents containing them, and their use. 4,797,471, Cl. 514-18.000.
Teijin Limited: *See*—
Tanaka, Toshio; Hazato, Atsuo; and Kurozumi, Seizi, 4,797,506, Cl. 560-121.000.
Tekmate Industries Inc.: *See*—
Rios, Jess, 4,797,663, Cl. 340-691.000.
Tektronix, Inc.: *See*—
Metz, Arthur J., 4,797,572, Cl. 307-269.000.
Traa, Einar O., 4,797,586, Cl. 307-603.000.
Telectronics N.V.: *See*—
Nakazawa, Akira; and Milijasevic, Zoran, 4,796,643, Cl. 128-785.000.
Regna, Richard C., 4,796,630, Cl. 128-419.00D.
Telefonaktiebolaget L M Ericsson: *See*—
Erikson, Hans O., 4,797,578, Cl. 307-303.000.
Telefonaktiebolaget Lm Ericsson: *See*—
Djupsjobacka, Anders G., 4,797,641, Cl. 332-7.510.
Temburg, Josef: *See*—
Kranefeld, Andreas; and Temburg, Josef, 4,796,335, Cl. 19-80.00R.
Temple University: *See*—
Speaker, Tully J.; Speaker, Tycho J.; and Collett, John H., 4,797,234, Cl. 264-4.100.
Teodorescu, Marius C.; and Gaspar, Alexandre M., to Board of Trustees, University of Illinois. Bacteriophages as recognition and identification agents. 4,797,363, Cl. 435-235.000.
Terasaki, Paul I.; Loon, Jimmy; Hardiwidjaja, Steven; and El-Awar, Nadim, to University of California, The Regents of the. Method and composition for isolating white cell elements. 4,797,475, Cl. 530-387.000.
Terashita, Takaaki; and Iijima, Hideaki, to Fuji Photo Film Co., Ltd. Photographic printing method. 4,797,713, Cl. 355-77.000.
Terashita, Takaaki: *See*—
Hayashi, Ryoichi; Sakamoto, Kiichiro; and Terashita, Takaaki, 4,797,712, Cl. 355-38.000.
Teroson GmbH: *See*—
Grimm, Stefan; Schatzle, Michael; and Stahr, Fritz, 4,797,463, Cl. 528-60.000.
Terrenzio, Gabriel M., to Acrowood Corporation. Impeller for an impact crusher. 4,796,822, Cl. 241-275.000.
Teshima, Daisuke: *See*—
Koizumi, Satoru; Teshima, Daisuke; and Katayama, Yoshio, 4,797,759, Cl. 360-92.000.
Testa, Michele. Pharmaceutical compounds effective against several disorders of the eye in particular the cataract and composition containing them. 4,797,422, Cl. 514-912.000.
Tetior, Alexandr N.: *See*—
Golovko, Viktor A.; Valts, Semen P.; Lekhno, Alexandr M.; Tetior, Alexandr N.; and Barykin, Boris J., 4,796,398, Cl. 52-169.200.
Tetra Park Finance & Trading S.A.: *See*—
Reil, Wilhelm, 4,796,802, Cl. 229-108.000.
Texas Industries Inc.: *See*—
van der Lely, Cornelis, 4,796,417, Cl. 56-341.000.
Texas Instruments Incorporated: *See*—
Bellay, Jeffrey D.; McDonough, Kevin C.; and Patrick, Michael W., 4,797,808, Cl. 364-200.000.
Goudie, Kathleen M., 4,797,930, Cl. 381-52.000.
Hashimoto, Masashi, 4,797,725, Cl. 357-54.000.
Hsu, Wei-Chan; Krenik, William R.; and Hellums, James R., 4,797,631, Cl. 330-253.000.
Malhi, Satwinder S.; and Pollack, Gordon P., 4,797,373, Cl. 437-60.000.
McEntee, Timothy J.; Bloemer, Robert W.; Oxley, Donald W.; and Thatte, Satish M., 4,797,810, Cl. 364-200.000.
Schreck, John F.; Coffman, Timmie M.; and Wilmoth, David D., 4,797,857, Cl. 365-203.000.
Verret, Douglas P.; Smayling, Michael C.; Sachdeva, Abnash C.; and Keller, Stephen A., 4,797,372, Cl. 437-034.000.
Yalowitz, Charles I.; and Harris, Ronald D., 4,797,884, Cl. 371-9.000.
Textron Inc.: *See*—
Crigger, Edward G., 4,797,022, Cl. 403-408.100.
Thakkar, Arvind L.; and Gibson, Lowell L., to Eli Lilly and Company. Orally administerable sustained release pharmaceutical formulations. 4,797,286, Cl. 424-456.000.
Thatcher, Donald N.: *See*—
Chiang, Tien-Hon; and Thatcher, Donald N., 4,797,085, Cl. 425-405.200.
Thatte, Satish M.: *See*—
McEntee, Timothy J.; Bloemer, Robert W.; Oxley, Donald W.; and Thatte, Satish M., 4,797,810, Cl. 364-200.000.
Thermonetics Corporation: *See*—
Sabin, Cullen M., 4,796,471, Cl. 73-295.000.
Thermoscan Inc.: *See*—
Fraden, Jacob, 4,797,840, Cl. 364-557.000.
Thielen, Christoph; and Nagler, Franz. Drive slip control system for a motor vehicle. 4,796,718, Cl. 180-197.000.
Thillays, Jacques C.; and Vallee, Jean-Claude A., to U.S. Philips Corporation. Optoelectric component for surface mounting. 4,797,715, Cl. 357-17.000.
Tholander, Lars H. G., to Aktiebolaget IRO. Yarn storing, feeding and measuring device. 4,796,675, Cl. 139-452.000.
Thoma, Ed, to Beloit Corporation. Chip slicer improvement. 4,796,818, Cl. 241-85.000.
Thomas, Anthony J.: *See*—
Moos, Walter H.; and Thomas, Anthony J., 4,797,419, Cl. 514-588.000.
Thomas, Charles A.; and Bland, William N., Jr. Illuminated spoke mounted reflector for bicycles. 4,796,972, Cl. 350-99.000.
Thomas, Friedrich-Werner: *See*—
Stenzel, Otto; and Thomas, Friedrich-Werner, 4,797,897, Cl. 373-105.000.
Thompson, Howard G., Jr.: *See*—
Edwards, Wallace L.; Jones, Joel F.; and Thompson, Howard G., Jr., 4,797,075, Cl. 418-48.000.
Thomson-CSF: *See*—
Berger, Jean L.; and Arques, Marc, 4,797,546, Cl. 250-214.00R.
Berger, Jean L.; and Arques, Marc, 4,797,560, Cl. 250-578.000.
Choisnet, Joel, 4,797,603, Cl. 324-60.CD.
Thorpe, David, to Imperial Chemical Industries PLC. Bromine-containing polyols. 4,797,429, Cl. 521-163.000.
Thorsman & Co. Aktiebolag: *See*—
Lofving, Stig-Arne, 4,797,507, Cl. 174-48.000.
Tibbals, E. C., Jr. Circular weft knitting machine. 4,796,444, Cl. 66-13.000.
Timmermann, Uwe: *See*—
Pospischil, Reginhard; Breitfelder, Peter; and Timmermann, Uwe, 4,797,875, Cl. 370-92.000.
Timofeev, Vladimir I.: *See*—
Rasi-Zade, Artur T. O.; Kurbanov, Nariman G. O.; Sutovsky, Pavel M.; Shikhlinsky, Talat M. O.; Kakhramanov, Khalid T.; Rabinovich, Avraam M.; Karaev, Islam K. O.; Timofeev, Vladimir I.; and Ibragimov, Oktai I. O., deceased, 4,796,799, Cl. 228-155.000.
Toal, Robert P., Jr. Motor vehicle locator system. 4,797,671, Cl. 340-825.490.
Tobinai, Teruhiko: *See*—
Sejimo, Yoshimi; Tsubai, Toshiaki; and Tobinai, Teruhiko, 4,796,582, Cl. 123-378.000.
Toews, Hans G., to Moog Inc. Two-axis force motor. 4,796,664, Cl. 137-595.000.
Tohoku Mikuni Kogyo Kabushiki Kaisha: *See*—
Kubota, Kenichi, 4,797,073, Cl. 417-461.000.
Toida, Tomohiro: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.
Toide, Eiichi: *See*—
Shikama, Shinsuke; Kondo, Mitsushige; and Toide, Eiichi, 4,797,545, Cl. 250-201.000.
Tojo, Chiaki: *See*—
Kobayashi, Yoshio; Tojo, Chiaki; and Kinoshita, Masayoshi, 4,796,547, Cl. 110-263.000.
Tokoro, Hiroyoshi: *See*—
Takano, Yasuo; Tokoro, Hiroyoshi; Kobayashi, Junji; Yamada, Masato; Harada, Toshimitsu; and Hosoya, Kensei, 4,796,561, Cl. 118-657.000.
Tokumaru, Sennosuke; Kubo, Michinori; and Nogami, Mari, to Tokumaru, Sennosuke. Lyophilized process for the production of a kefir yoghurt. 4,797,290, Cl. 426-43.000.
Tokumitsu, Shuichi: *See*—
Tamura, Hisao; Tokumitsu, Shuichi; and Tagawa, Yuji, 4,796,951, Cl. 297-337.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Fukuma, Yasufumi; Oana, Yoshinori; and Arai, Akihiro, 4,796,989, Cl. 351-212.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Nakamura, Yoichi; Yamamoto, Shirushi; Komine, Takashi; Yokota, Akira; and Nakane, Hisashi, 4,797,348, Cl. 430-326.000.
Tokyo Tatsuno Co., Ltd.: *See*—
Motohashi, Toshiaki; and Saisu, Yasushi, 4,796,678, Cl. 141-206.000.
Tolomay, James E. Ice fishing shelter. 4,796,649, Cl. 135-102.000.
Tom, Glenn M.; and Brown, Duncan W., to Advanced Technology Materials Inc. Process and composition for purifying hydrogen selenide and hydrogen telluride, to remove moisture and oxidant impurities therefrom. 4,797,227, Cl. 252-194.000.
Tome, Richard E.: *See*—
Blaushild, Ronald M.; Golick, Leonard R.; Samluk, Stephen L.; and Tome, Richard E., 4,797,247, Cl. 376-289.000.
Tomeo, Peter F., Jr. Fishing lure. 4,796,374, Cl. 43-35.000.
Tominaga, Takashi: *See*—
Sakuramoto, Takahumi; Asoshina, Eishi; Tominaga, Takashi; Ijichi, Ichiro; Kamei, Kiyohiro; and Konishi, Toshiharu, 4,797,251, Cl. 419-9.000.
Tomita, Katsuhiko, to Horiba, Ltd. Sheet type electrode for use in measurement of ions. 4,797,188, Cl. 204-414.000.

Tomiyama, Akira: *See*—
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, 4,797,415, Cl. 514-469.000.
Tomiyama, Tsuyoshi; Tomiyama, Akira; and Kubota, Koichi, to Kotobuki Seiyaku Company Limited. Benzofuran derivatives and use thereof for treating hyperuricemia. 4,797,415, Cl. 514-469.000.
Topham, Susan A., to Imperial Chemical Industries PLC. Catalyst. 4,797,383, Cl. 502-338.000.
Topper, Robert J.: *See*—
Dischert, Lee R.; and Topper, Robert J., 4,797,731, Cl. 358-17.000.
Toriuchi, Masaharu: *See*—
Takahashi, Osamu; Ogawa, Tadashi; Sakai, Minoru; and Toriuchi, Masaharu, 4,797,349, Cl. 430-372.000.
Toshiba Corporation: *See*—
Kobayashi, Masahiro; Matsushita, Akitake; Nakamura, Hitoshi; Tanaka, Shinji; and Furuya, Shuji, 4,796,653, Cl. 137-341.000.
Toth, Andrew J.: *See*—
Moore, Paul E.; Henderson, Jeffrey S.; Soisson, Lawrence R.; and Toth, Andrew J., 4,797,528, Cl. 219-70.000.
Toti, Andrew J. Decorative awning and facia structures and methods and apparatus for forming the same. 4,796,393, Cl. 52-76.000.
Toto Ltd.: *See*—
Kishima, Noboru; and Matsumoto, Akio, 4,797,425, Cl. 521-64.000.
Townsend, Mitchell: *See*—
Townsend, Thomas R.; and Townsend, Mitchell, 4,796,706, Cl. 166-380.000.
Townsend, Thomas R.; and Townsend, Mitchell. Liner setting apparatus and method for use in well casings. 4,796,706, Cl. 166-380.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Shuto, Satoshi; Ito, Hiromichi; Fukukawa, Kiyofumi; Sakakibara, Hideo; and Tsujino, Masatoshi, 4,797,479, Cl. 536-27.000.
Toyoda Gosei Co., Ltd.: *See*—
Hiramitsu, Tetsushi; Ono, Satoshi; Hirano, Atsuo; and Murase, Zenzaburo, 4,796,482, Cl. 74-492.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Ohta, Takeshi; Kamiya, Yoji; Nakashima, Kunimichi; and Taniguchi, Mitsuyoshi, 4,797,052, Cl. 414-744.300.
Toyono, Tsutomu: *See*—
Kaneko, Shuzo; Toyono, Tsutomu; and Kanbe, Junichiro, 4,796,980, Cl. 350-350.00S.
Toyota Central Research & Development Laboratories, Inc.: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,797,823, Cl. 364-424.050.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,797,823, Cl. 364-424.050.
Kumagai, Tadanobu, 4,796,722, Cl. 180-297.000.
Nagai, Toshinari; and Kayanuma, Nobuaki, 4,796,425, Cl. 60-274.000.
Nakaniahi, Nobuyasu; Noguchi, Noboru; Aizawa, Hideyuki; and Ito, Kenzi, 4,797,612, Cl. 324-173.000.
Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; and Sanada, Yuji, 4,797,088, Cl. 431-15.000.
Traa, Einar O., to Tektronix, Inc. Controllable delay circuit. 4,797,586, Cl. 307-603.000.
Trach, Guenther: *See*—
Seibert, Wolfram; Ocvirk, Norbert; Trach, Guenther; and Maas, Joachim, 4,796,959, Cl. 303-119.000.
Trager, Louis: *See*—
Dholakia, Anil R.; and Trager, Louis, 4,797,728, Cl. 357-81.000.
Trans-World Marketing Corporation: *See*—
Franklin, Robert P.; and LaRocca, John, 4,796,763, Cl. 211-133.000.
Transamerica DeLaval Inc.: *See*—
Conlow, Frank J., 4,797,065, Cl. 416-220.00R.
Transtector Systems, Inc.: *See*—
Honorof, Frank D.; and Odenberg, Richard, 4,797,773, Cl. 361-58.000.
Tratschin, Jon D.: *See*—
Carter, Barrie J.; and Tratschin, Jon D., 4,797,368, Cl. 435-320.000.
Tri-State Oil Tool Industries, Inc.: *See*—
Lynde, Gerald D.; Winterrowd, Kenneth W.; and Harvey, Harold H., Jr., 4,796,709, Cl. 166-55.600.
Trifari, Krussman & Fishel, Inc.: *See*—
Bannister, A. Karen; Brandriff, Kristen; Carlotto, John A.; DiDonato, Richard J.; Haigh, Virginia; and Sirois, Edmond, 4,796,443, Cl. 63-14.500.
Trimble, David C.: *See*—
Pope, Kevin T.; and Trimble, David C., 4,797,877, Cl. 370-62.000.
Tringali, Dominick: *See*—
Clark, Michael R.; Kuipper, Gerald J.; Monson, Donald B.; and Tringali, Dominick, 4,797,516, Cl. 200-51.00R.
Trittschuh, Everett P., III: *See*—
Ponziani, Richard L.; Davies, William E.; and Trittschuh, Everett P., III, 4,797,110, Cl. 439-83.000.
Trolltsch, Karl: *See*—
Oprach, Klaus; Harms, Luhr; Braun, Gebhard; and Trolltsch, Karl, 4,796,359, Cl. 30-43.920.
Tronomed, Inc.: *See*—
Malana, Anthony, 4,797,125, Cl. 439-729.000.
Trott, Arthur F.; and Marchand, Sam R., to Concept, Inc. Lashliner. 4,796,624, Cl. 128-316.000.
Trutek Research, Inc.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,796,614, Cl. 128-200.140.
Trutzschler GmbH & Co. KG: *See*—
Kranefeld, Andreas; and Temburg, Josef, 4,796,335, Cl. 19-80.00R.
TRW Inc.: *See*—
Wood, Ruey E., Jr., 4,797,019, Cl. 403-133.000.
Tsai, Yusheng T., to Eastman Kodak Company. System incorporating an error tolerant picture compression algorithm. 4,797,729, Cl. 358-13.000.
Tsals, Izrail; Feygin, Ilya; and Marder, William, to General Motors Corporation. Variable permeability steering torque sensor. 4,796,463, Cl. 73-862.330.
Tschudi, Christoph; and Wittwer, Fitz, to BBC Brown, Boveri & Company Limited. Triggering method for a thyristor switch. 4,797,587, Cl. 307-646.000.
Tsitsichvili, Jean, to Cogema-Compagnie Generale des Matieres Nucleaires. Gripping apparatus for a group of rods of nuclear fuel assembly. 4,797,248, Cl. 376-261.000.
Tsubai, Toshiaki: *See*—
Sejimo, Yoshimi; Tsubai, Toshiaki; and Tobinai, Teruhiko, 4,796,582, Cl. 123-378.000.
Tsuboyama, Akira, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device having dual laminated alignment films. 4,796,979, Cl. 350-350.00S.
Tsubuko, Kazuo, to Ricoh Co., Ltd. Liquid developer for electrophotography. 4,797,341, Cl. 430-114.000.
Tsuchiya, Yutaka: *See*—
Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,796,992, Cl. 356-347.000.
Takiguchi, Yoshihiro; and Tsuchiya, Yutaka, 4,797,747, Cl. 358-217.000.
Tsuji, Akira; and Takai, Haruki, to NEC Corporation. Device for predicting unique word detection positions in a TDMA station by using latest valid detection positions. 4,797,678, Cl. 342-352.000.
Tsuji, Kenji: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Tsuji, Kenji; Omaki, Takanobu; and Nakai, Masaaki, 4,797,702, Cl. 354-413.000.
Tsuji, Kiyoshi: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; Okumura, Hiroyuki; and Nakaguchi, Osamu, 4,797,399, Cl. 514-253.000.
Tsuji, Sadahiko; and Inaba, Hiroyoshi, to Canon Kabushiki Kaisha. Diaphragm device. 4,797,700, Cl. 354-271.100.
Tsujino, Masatoshi: *See*—
Shuto, Satoshi; Ito, Hiromichi; Fukukawa, Kiyofumi; Sakakibara, Hideo; and Tsujino, Masatoshi, 4,797,479, Cl. 536-27.000.
Tsukakoshi, Masao: *See*—
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Tsuru, Yoshikazu: *See*—
Takita, Masaaki; Tsuru, Yoshikazu; Ushihara, Masaharu; Itoh, Taichi; and Tanaka, Masumi, 4,797,690, Cl. 346-105.000.
Tsuta, Toshio; Kadota, Koji; Matsui, Shigetomo; Matsumura, Hiroyuki; Hasegawa, Hisao; Nakamura, Hiromichi; Noma, Tetsuro; Miyazaki, Hisahiko; and Furugen, Munekatsu, to Kawasaki Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries Ltd. Method of and apparatus for continuous production of seam-welded metal tubing. 4,796,798, Cl. 228-146.000.
Tsuyuki, Isao, to Fuji Photo Film Co., Ltd. Apparatus for precisely measuring and supplying liquid. 4,796,787, Cl. 222-64.000.
Tsuzurahara, Mamoru, to Hitachi, Ltd. Filter apparatus for a magnetron. 4,797,596, Cl. 315-5.130.
Tuchiya, Takanori: *See*—
Fukutomi, Hisao; Tuchiya, Takanori; Yamamoto, Takeshi; Konishi, Takeshi; and Hamasaki, Iseo, 4,796,943, Cl. 296-65.100.
Tucker, Wilson H. Clip applicator and spreadable clips for use therein. 4,796,627, Cl. 128-337.000.
Tulloch, Rory: *See*—
Forrest, John; Stewart, William; and Tulloch, Rory, 4,796,704, Cl. 166-317.000.
Tunkel, Jeffrey W.: *See*—
Ambrose, Stephen D.; Tunkel, Jeffrey W.; and Shelley, Joseph F., 4,797,518, Cl. 200-61.890.
Turchini, Luigi: *See*—
Garlisi, Salvatore; Turchini, Luigi; Albanini, Aurelio; and Fornara, Dario, 4,797,481, Cl. 536-116.000.
Turley, R. Steven: *See*—
Steel, Duncan G.; and Turley, R. Steven, 4,797,552, Cl. 250-251.000.
Turnbull, Michael D.; and Kay, Ian T., to Imperial Chemical Industries PLC. Morpholine compounds, compositions and use. 4,797,398, Cl. 514-237.500.
Tworoger, Peter C.; and Johnson, E. A., to Atlas Marine Technologies. Load moving apparatus. 4,797,055, Cl. 414-283.000.
Tyan, Yuan S.; Pan, Kee C.; and Vazan, Fridrich, to Eastman Kodak Company. Erasable optical recording method. 4,797,871, Cl. 369-100.000.
Tyler, D. Kevin, to Litton Industrial Automation Systems, Inc. Clutch and lock mechanism. 4,796,737, Cl. 192-18.00R.
Tyler, Michael E. Gate locking device. 4,796,385, Cl. 49-280.000.
Tyler, William R.: *See*—
Snow, Michael G.; Tyler, William R.; Hsu, Sung-Peng; and Fallat, Robert J., 4,796,639, Cl. 128-719.000.
Ube Industries, Ltd.: *See*—
Kunimoto, Akihiro; Takabayashi, Seiichiro; and Matsui, Yuji, 4,797,307, Cl. 427-386.000.
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Uchida, Itsuo: *See*—
Okamoto, Masanori; Uchida, Itsuo; Umehara, Kazuyoshi; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,797,417, Cl. 514-473.000.

Uchino, Fumiko: *See*—
Iino, Syuji; Hotomi, Hideo; Saeki, Noboru; Fujiwara, Masanori; Uchino, Fumiko; and Osawa, Izumi, 4,797,338, Cl. 430-58.000.

Uchiyama, Kunio; and Nishimukai, Tadahiko, to Hitachi, Ltd. Virtual memory supported processor having restoration circuit for register recovering. 4,797,816, Cl. 364-200.000.

Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; Okumura, Hiroyuki; and Nakaguchi, Osamu, to Fujisawa Pharmaceutical Co., Ltd. Piperazine compounds and antithrombotic pharmaceutical composition comprising the same. 4,797,399, Cl. 514-253.000.

Ueda, Kiyotsugu: *See*—
Ishibashi, Koichiro; Minato, Osamu; Masuhara, Toshiaki; Sakai, Yoshio; Yamanaka, Toshiaki; Hashimoto, Naotaka; Hanamura, Shoji; Moriwaki, Nobuyuki; Honjyo, Shigeru; and Ueda, Kiyotsugu, 4,797,717, Cl. 357-23.100.

Ueda, Kouhei, to Taisei Corporation. Reproduction process of the existing pipeline. 4,796,673, Cl. 138-97.000.

Ueda, Seiji, to Matsushita Electronics Corporation. MOS capacitor with direct polycrystalline contact to grooved substrate. 4,797,719, Cl. 357-23.600.

Ueda, Shiro: *See*—
Sumimoto, Shinzaburo; Ishizuka, Ichiro; Kai, Hiroyuki; Ueda, Shiro; and Takase, Akira, 4,797,492, Cl. 548-245.000.

Ueda, Tsunehisa: *See*—
Miki, Yoshiaki; and Ueda, Tsunehisa, 4,797,274, Cl. 424-76.100.

Uekusa, Tadashi; Koizumi, Takashi; and Amano, Nobuhiko, to Fuji Photo Film Co., Ltd. Analyzer for ionic activity measurement. 4,797,193, Cl. 204-416.000.

Uemura, Morito: *See*—
Brandt, Alan E.; and Uemura, Morito, 4,797,356, Cl. 435-7.000.

Uenaka, Kazushige; Takase, Haruo; Utomo, Riuzi; and Akimoto, Masuo, to Fuji Photo Film Co., Ltd. Film feeding apparatus. 4,797,698, Cl. 354-275.000.

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Lohse, Walter, 4,796,559, Cl. 118-210.000.

Umehara, Kazuyoshi: *See*—
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Kojima, Kazuo, 4,797,916, Cl. 379-454.000.

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Myerly, Richard C.; Jorgenson, Michael W.; and Critchfield, Frank E., 4,797,501, Cl. 556-445.000.
Snyder, William J., 4,797,776, Cl. 361-103.000.

Union Special Corporation: *See*—
Adamski, Maximilian, Jr., 4,796,552, Cl. 112-285.000.

Uniroyal Chemical Company, Inc.: *See*—
Capolupo, Janet D.; and Chucta, Thomas M., 4,797,511, Cl. 174-110.0PM.

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Fixsen, Dale J.; Hastings, Roger N.; and Imsdahl, John A., 4,796,432, Cl. 62-45.000.
Frew, Duncan W.; and Shadwick, Robert P., 4,797,303, Cl. 427-131.000.
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Agriculture: *See*—
McGovern, Terrence P.; and Burden, George S., 4,797,408, Cl. 514-315.000.
Yokoyama, Henry; Hsu, Wan-Jean; Poling, Stephen M.; and Hayman, Ernest P., 4,797,153, Cl. 71-121.000.
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Driscoll, Michael M., 4,797,639, Cl. 331-158.000.
La Mar, Charles R., 4,797,555, Cl. 250-336.100.
Yamamoto, Tsutomu, 4,796,838, Cl. 244-135.00A.
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Glendinning, William B., 4,797,334, Cl. 430-5.000.
Heydrich, Hans, 4,796,572, Cl. 123-41.420.
Hoffman, Steven L.; and Rammage, Robert L., 4,797,623, Cl. 324-556.000.
Mikhail, Ameer G., 4,796,534, Cl. 102-374.000.
Scully Andrew J., 4,796,336, Cl. 24-68.0CD.
Webster, Steve L., 4,797,026, Cl. 404-28.000.
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Chaffin, Roger J., deceased; Dawson, Ralph; Fritz, Ian J.; Osbourn, Gordon C.; and Zipperian, Thomas E., 4,797,716, Cl. 357-22.000.
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Lu, David Y.; and Bowman, Robert L., 4,796,622, Cl. 128-303.100.
Navy: *See*—
Gerlach, Karl, 4,797,807, Cl. 364-724.070.

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Ahlstrom, Lars G. W., 4,796,834, Cl. 244-3.160.
Cusdin, Anthony R.; Dadds, Alan F.; and Mallinson, Peter, 4,797,679, Cl. 342-387.000.
De Jong, Henricus J. J. M., 4,797,595, Cl. 313-493.000.
Dekker, Evert H. L. J., 4,797,788, Cl. 361-540.000.
Enz, Ulrich E., 4,797,766, Cl. 360-113.000.
Guery, Alain, 4,797,632, Cl. 330-285.000.
Habraken, Johannes C., 4,796,796, Cl. 228-37.000.
Ingeveld, Johannes W.; and Westerhof, Albert J., 4,797,302, Cl. 427-107.000.
Kraus, Uwe E., 4,797,883, Cl. 370-109.000.
Martiny, Ingo A., 4,797,581, Cl. 307-475.000.
Murray, Bruce; Guillou, Louis; and Coutrot, Francoise M. R., 4,797,919, Cl. 380-20.000.
Ochmann, Rudolf; and Zimmermann, Robert H., 4,797,905, Cl. 378-108.000.
Shannon, John M., 4,797,722, Cl. 357-34.000.
Stikvoort, Eduard F., 4,797,845, Cl. 364-724.100.
Thillays, Jacques C.; and Vallee, Jean-Claude A., 4,797,715, Cl. 357-17.000.

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Adell, Robert, 4,796,386, Cl. 49-462.000.

United Technologies Corporation: *See*—
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Kosowsky, Lester H.; Raber, Peter E.; and Horais, Brian J., 4,797,683, Cl. 343-872.000.
Levy, Alexander H.; and Lipman, Kenneth, 4,797,186, Cl. 204-129.000.

Unitek Corporation: *See*—
Armstrong, Maclay M.; Houser, Steven A.; and Armstrong, Jeffrey A., 4,797,095, Cl. 433-22.000.

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Sorbi, Robert T.; Caretta, Antonio; Cavaggioni, Andrea; and Marchesi Gastaldi, Liliana, 4,797,480, Cl. 536-27.000.

University of California, The Regents of the: *See*—
Terasaki, Paul I.; Loon, Jimmy; Hardiwidjaja, Steven; and El-Awar, Nadim, 4,797,475, Cl. 530-387.000.

University of Dayton: *See*—
Salyer, Ival O., 4,797,160, Cl. 106-96.000.

University of Minnesota, Regents of the: *See*—
Marpel, Virgil A., 4,796,475, Cl. 73-863.220.
Tarsio, Joseph F.; and Furcht, Leo T., 4,797,473, Cl. 530-387.000.

University of Queensland, The: *See*—
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University of Rochester: *See*—
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University Patents, Inc.: *See*—
Eidman, Kirk F.; and Walba, David M., 4,797,503, Cl. 558-389.000.

Unterlass, Josef: *See*—
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Zinnen, Hermann A., 4,797,233, Cl. 260-428.500.

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Ushihara, Masaharu: *See*—
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Ushiyama, Hisayuki: *See*—
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V. Kann Rasmussen Industri A/S: *See*—
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Vallee, Jean-Claude A.: *See*—
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Valts, Semen P.: *See*—
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Van Dale Inc.: *See*—
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Van Wormer Management Corporation: *See*—
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Vandenbosche, Jean J.: *See*—
Junino, Alex; Lang, Gerard; Jehanno, Nicole; and Vandenbosche, Jean J., 4,797,129, Cl. 8-407.000.

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van der Lely, Cornelis, to Texas Industries Inc. Balers. 4,796,417, Cl. 56-341.000.

Vanderweg, Peter: *See*—
Amos, Barry L.; Sapelak, Ronald; and Vanderweg, Peter, 4,796,480, Cl. 74-483.00R.

Vanevenhoven, Peter W.: *See*—
Brooks, Norman D.; Kenyon, Rebecca A.; and Vanevenhoven, Peter W., 4,797,275, Cl. 424-78.000.

Van Gompel, Paul T., to Kimberly-Clark Corporation. Coated fabric and method of making the same. 4,797,171, Cl. 156-322.000.

van Lookeren-Campagne, Constant J.; and Obeng, Edward D. A., to Shell Oil Company. Gas treatment and resin regeneration process. 4,797,366, Cl. 435-264.000.

van Mastrigt, Max: *See*—
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Van Natta, Terry L.; and Hartwig, Donald R., to Deere & Co. Single angled blade coulter and fertilizer opener. 4,796,550, Cl. 111-87.000.

Vantine, Kurt. Ear protector. 4,796,307, Cl. 2-209.000.

VanVlack, Edward E. Gas control apparatus. 4,797,132, Cl. 55-227.000.

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Velasco, Vincente S. Improvements introduced in the anchoring systems by means of threaded bolts. 4,797,044, Cl. 411-51.000.

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Ventura, Lori M. Slit lamp assembly. 4,796,859, Cl. 351-245.000.

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Verdouw, Albert J., to General Motors Corporation. Combustor diffuser. 4,796,429, Cl. 60-751.000.

Ver Ploeg, Wendell J.: *See*—
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Verret, Douglas P.; Smayling, Michael C.; Sachdeva, Abnash C.; and Keller, Stephen A., to Texas Instruments Incorporated. Method of making a merge bipolar and complementary metal oxide semiconductor transistor device. 4,797,372, Cl. 437-034.000.

Vetco Gray Inc.: *See*—
Prichard, Richard M. H., 4,796,922, Cl. 285-26.000.

Veyrat, Gilles, to Alcatel. Motor and vane-pump assembly free from external oil leaks. 4,797,071, Cl. 417-410.000.

Viard, Noel: *See*—
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Victor Company of Japan, Ltd.: *See*—
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Victory Engineering Company: *See*—
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Video Sound, Inc.: *See*—
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Villamanan, Pablo R.: *See*—
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Vilsecker, Kurt: *See*—
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Dixon, George J., 4,797,893, Cl. 372-66.000.

Viscogliosi, Marco. Disc brake system. 4,796,729, Cl. 188-71.700.

Vliet, Ron: *See*—
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Vorzimmer, Mark A.; and Beardslee, John, to Instant Security Systems, Inc. Portable self-contained intrusion detector for passenger aircraft. 4,797,657, Cl. 340-541.000.

Voshall, Roy E., to Westinghouse Electric Corp. Vacuum-type circuit interrupter. 4,797,522, Cl. 200-144.00B.

Vulkor, Incorporated: *See*—
Wu, Alexander F.; and Walters, Robert B., 4,797,323, Cl. 428-389.000.

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W. Haking Enterprises Limited: *See*—
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W. R. Grace & Co.: *See*—
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Mobark, Bengt U., 4,796,408, Cl. 53-427.000.
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Wafford, Terrell F.: *See*—
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Wahlig, Helmut; and Dingeldein, Elvira, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Drug depot containing cytostatics. 4,797,282, Cl. 424-422.000.

Wakata, Hideo; Imoto, Yuzo; Takei, Toshihiro; and Hattori, Yoshiyuki, to Nippondenso Co., Ltd. Vehicular drive control system. 4,796,957, Cl. 303-116.000.

Wakeman, Russell, to Allied-Signal Inc. Idle control valve for use with a throttle assembly of an internal combustion engine. 4,796,580, Cl. 123-339.000.

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Wakeman, Thomas G.: *See*—
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Waki, Tatsuo; Watanabe, Takeshi; and Suzuki, Kazuo, to Lonseal Corporation. Hard polyvinyl chloride resin composition and open-cell foam made of said composition. 4,797,426, Cl. 521-93.000.

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Walbro Far East, Inc.: *See*—
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Nagasaka, Kohji; Kobayashi, Takeshi; and Sejimo, Yoshimi, 4,796,583, Cl. 123-378.000.
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Walby, Douglas R., to Hughes Aircraft Company. Pipelined bit-serial Galois Field multiplier. 4,797,848, Cl. 364-754.000.

Wales, R. Langdon; and Crowley, H. W., to Automation, Inc. Ink monitor system. 4,796,782, Cl. 222-57.000.

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Wanamaker, Joseph L.: *See—*
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Butts, Kenneth R.; and Wanamaker, Joseph L., 4,796,853, Cl. 251-129.050.
Wang, Karl L.; and Sood, Lal C., to Motorola, Inc. Semiconductor memory with divided word lines and shared sense amplifiers. 4,797,858, Cl. 365-230.000.
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Wardlaw, Douglas. Fracture brace. 4,796,611, Cl. 128-87.00R.
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Suto, Mark J.; and Werbel, Leslie M., 4,797,397, Cl. 514-212.000.
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Warwick, David R. Adaptable security grille and latching mechanism. 4,796,384, Cl. 49-55.000.
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Watada, Atsuyuki; and Ohmi, Fumiya, to Ricoh Company, Ltd. Magneto-optical recording material. 4,797,331, Cl. 428-694.000.
Watanabe, Hiroshi, to 501 Toppan Moore Company, Ltd. Selectable data readout IC card. 4,797,543, Cl. 235-492.000.
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Waterman, Carl D. Wood chipper to be transported and powered by a tractor. 4,796,819, Cl. 241-92.000.
Watlington, Thomas M., IV, to Boehringer Mannheim Corporation. Registration device for blood test strips. 4,797,256, Cl. 422-58.000.
Watson, George P.; and Meehan, Kathleen, to Lytel Corporation. Fabrication of integral lenses on LED devices. 4,797,179, Cl. 156-647.000.
Watterson, Scott R., to Weslo, Inc. Multipurpose exercising apparatus. 4,796,881, Cl. 272-72.000.
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Webb, George, to Magnavox Government and Industrial Electronics Company. Safe and arm device for spinning munitions. 4,796,532, Cl. 102-233.000.
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Weber, Ronald M., to AMP Incorporated. Programmable modular connector assembly. 4,797,123, Cl. 439-717.000.
Webler, William E., to American Hospital Supply Corporation. Apparatus with fast response thermistor. 4,796,640, Cl. 128-736.000.
Webster Spring Co. Inc.: *See—*
Hagemeister, Robert C., 4,796,872, Cl. 267-103.000.
Webster, Steve L., to United States of America, Army. Expandable sand-grid for stabilizing an undersurface. 4,797,026, Cl. 404-28.000.
Wedlake, Roger J.: *See—*
Coetzer, Johan; and Wedlake, Roger J., 4,797,333, Cl. 429-103.000.
Wei, George C.: *See—*
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Weiland-Werke AG: *See—*
Kastner, Hans-Werner; Klockler, Robert; and Hage, Manfred, 4,796,693, Cl. 165-133.000.
Weise, Wolfgang: *See—*
Boehm, Wolfgang; Hausselt, Juergen; Weise, Wolfgang; and Malikowsik, Willi, 4,797,328, Cl. 428-621.000.
Weisenburger, Lawrence P., to AMP Incorporated. Wire holders and harnesses incorporating wire holders. 4,797,112, Cl. 439-55.000.
Weiss, Ilan. Pop-up sprinkler with improved inlet valve. 4,796,804, Cl. 239-1.000.
Welch Allyn, Inc.: *See—*
Allred, Jimmie B., III; and Bingham, Richard, 4,796,607, Cl. 128-4.000.
Welch, Stuart J.: *See—*
Liggins, Brian D.; Round, Timothy S.; Welch, Stuart J.; and Reynolds, Gordon F., 4,796,923, Cl. 285-27.000.
Wella Aktiengesellschaft: *See—*
Clausen, Thomas; and Konrad, Eugen, 4,797,130, Cl. 8-421.000.
Wellcome Australia Limited: *See—*
Ardley, John H.; Smith, Brett A.; and Nicholls, Alison W., 4,797,301, Cl. 427-8.000.
Welzel, Dieter; and Buhlmann, Hans, to Sandoz Ltd. Pharmaceutical preparation comprising co-dergocrine and a calcium antagonist. 4,797,404, Cl. 514-288.000.
Wende, Russell E., to Methode Electronics, Inc. Coiled wire interconnector. 4,797,109, Cl. 439-15.000.
Wentzell, Timothy H., to Combustion Engineering, Inc. Expandable eddy current probe for inspecting the interior of tubular conduits. 4,797,613, Cl. 324-220.000.
Werbel, Leslie M.: *See—*
Suto, Mark J.; and Werbel, Leslie M., 4,797,397, Cl. 514-212.000.
Wernholm, Thomas D.: *See—*
Wolfe, Brian C.; and Wernholm, Thomas D., 4,796,579, Cl. 123-336.000.
Weslo, Inc.: *See—*
Watterson, Scott R., 4,796,881, Cl. 272-72.000.
Wessling, Ritchie A.; Schmidt, Donald L.; and Aikawa, Kiyoshi I., to Dow Chemical Company, The. Aqueous-dispersible cyclic sulfonium compounds that cure to form water-insoluble polymers. 4,797,456, Cl. 525-531.000.
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Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,797,187, Cl. 204-180.200.
West, John G. W., to Lucas Industries Public Limited Company. Dynamo electric machines. 4,797,602, Cl. 322-10.000.
West, Michael P.: *See—*
Linn, Edwards E.; and West, Michael P., 4,797,272, Cl. 424-59.000.
West, Robert N., to Sira Limited. Inspection apparatus including photodetection and scanning apparatus. 4,797,558, Cl. 250-572.000.
Westell, William E., to Baird Corporation. Video image enhancer. 4,797,745, Cl. 358-169.000.
Westendorf Mfg. Co., Inc.: *See—*
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,797,051, Cl. 414-686.000.
Westendorf, Neal W.: *See—*
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,797,051, Cl. 414-686.000.
Westerhof, Albert J.: *See—*
Ingeveld, Johannes W.; and Westerhof, Albert J., 4,797,302, Cl. 427-107.000.
Western Atlas International, Inc.: *See—*
Beasley, Craig J., 4,797,861, Cl. 367-50.000.
Western Digital Corporation: *See—*
Lofgren, Karl M. J., 4,797,575, Cl. 307-272.100.
Westerwaelder Eisenwerk Gerhard GmbH: *See—*
Gerhard, Helmut, 4,796,773, Cl. 220-22.000.
Westfaliache Metall Industrie KG, Hueck & Co.: *See—*
Brodling, Gunter; Feyerabend, Franz; Hubert, Peter; Krahling, Franz; Peitz, Wolfgang; Sewing, Karlernst; and Schnelle, Diethard, 4,797,790, Cl. 362-61.000.
Westinghouse Electric Corp.: *See—*
Blaushild, Ronald M.; Golick, Leonard R.; Samluk, Stephen L.; and Tome, Richard E., 4,797,247, Cl. 376-289.000.
Fox, David A., 4,797,570, Cl. 307-87.000.
Voshall, Roy E., 4,797,522, Cl. 200-144.00B.
Westphal, Detlef: *See—*
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Westvaco Corporation: *See—*
Dilling, Peter; DelliColli, Humbert T.; and Davis, James E., 4,797,157, Cl. 106-20.000.

Wetle, Gerald J.: *See—*
Schultz, Duane M.; and Wetle, Gerald J., 4,796,794, Cl. 227-156.000.
Wetzel, Rolf; Coenen, Hubert; and Kreuch, Winfried, to Krupp-Koppers GmbH. Process for the working up of salvage oil. 4,797,198, Cl. 208-181.000.
Wexler, Jonathan B., to Fire Research Pty., Limited. Composite fire stop device. 4,796,401, Cl. 52-232.000.
Whetstone, Thomas N.: *See—*
Karg, Rodrick D.; and Whetstone, Thomas N., 4,797,059, Cl. 414-590.000.
Whipple, Sharon S.: *See—*
Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,797,187, Cl. 204-180.200.
White Consolidated Industries, Inc.: *See—*
Hayes, William R.; and Shea, Allan K., 4,796,857, Cl. 251-173.000.
White, George: *See—*
Montgomery, James R.; Figueroa, John A.; and White, George, 4,797,544, Cl. 250-221.000.
White, Paul S.; and Eaton, Michael D., to GKN Crompton Limited. Hinge for roof window. 4,796,331, Cl. 16-324.000.
White, Randall A., to Digital Equipment Corporation. D.C. power monitor. 4,797,608, Cl. 324-96.000.
Whitehall Corporation: *See—*
Hudson, Brian R., 4,796,365, Cl. 33-356.000.
Whiteman, Aharon E.: *See—*
Shoher, Itzhak; and Whiteman, Aharon E., 4,797,100, Cl. 433-222.100.
Whynall, Jeffrey M.: *See—*
Burt, John F.; Whynall, Jeffrey M.; Howe, Jonathan; Knott, Gilbert L.; and Harnvoraksiat, Tavin, 4,796,467, Cl. 73-168.000.
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Wicks, Anthony J.: *See—*
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Wicks & Wilson Limited: *See—*
Brash, Robert A. D.; Wicks, Anthony J.; and Wilson, Eric T., 4,797,709, Cl. 355-27.000.
Wideman, Lawson G.; and Hsu, Wen-Liang, to Goodyear Tire & Rubber Company, The. Polymeric hydrogenation catalyst containing pendant rhodium containing groups. 4,797,452, Cl. 525-338.000.
Widlar, Robert J., to National Semiconductor Corporation. Wide range operational amplifier input stage. 4,797,629, Cl. 330-258.000.
Wiley, Wallace F., to Robert Hooke Memorial Laboratories, Inc. Motion sensing device. 4,797,661, Cl. 340-664.000.
Wilkinson, Bryan: *See—*
Aguillen, Domingo V., Jr.; Casares, Pete P.; DeForrest, John E.; Green, Kevin C.; Kavanagh, Rocque A.; Wilkinson, Bryan; Marks, Marc K.; and Zuniga, Gerardo, 4,796,347, Cl. 29-280.000.
Will, Terry A., to International Business Machines Corporation. Method of identifying magnetic ink (MICR) characters. 4,797,938, Cl. 382-7.000.
Willand, Craig S.: *See—*
Robello, Douglas R.; Ulman, Abraham; and Willand, Craig S., 4,796,971, Cl. 350-96.340.
Willcocks, Reginald. Dual-function golf bag. 4,796,789, Cl. 224-202.000.
Williams, Bruce T. High voltage electrostatic surface potential monitoring system using low voltage A.C. feedback. 4,797,620, Cl. 324-458.000.
Williams, Jerry K., to General Motors Corporation. Elastic membrane seat with fluidic bladder tensioning apparatus and method. 4,796,955, Cl. 297-452.000.
Williams, Jill A.: *See—*
Billington, Richard W.; and Williams, Jill A., 4,797,431, Cl. 523-116.000.
Williams, John J., Jr. Load shoring beam for cargo trucks. 4,797,043, Cl. 410-145.000.
Williams, Ralph E., to Eastman Kodak Company. Disposable development station having means for assisting in the feeding of the toner supply and preventing replenishment of the toner supply. 4,797,704, Cl. 355-3.0DD.
Williamsen, Mark S.: *See—*
Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., 4,797,820, Cl. 364-420.000.
Willmen, Hans-Rainer: *See—*
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Wilmoth, David D.: *See—*
Schreck, John F.; Coffman, Timmie M.; and Wilmoth, David D., 4,797,857, Cl. 365-203.000.
Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., to Ansan Industries Limited. Programmable flow control valve unit with clock, program, automatic, manual, and repeat modes. 4,797,820, Cl. 364-420.000.
Wilson, Eric T.: *See—*
Brash, Robert A. D.; Wicks, Anthony J.; and Wilson, Eric T., 4,797,709, Cl. 355-27.000.
Wilson, Gary L.: *See—*
Boyd, Ronald J.; Law, Wing; and Wilson, Gary L., 4,796,632, Cl. 128-662.030.
Wilson, Geoff. Sub-surface game fishing lure. 4,796,375, Cl. 43-42.050.
Wilson, James E., to Stallion Trailer Kits, Inc. Spring loaded drop foot trailer jack. 4,796,864, Cl. 254-425.000.
Wilson, Roland B.; Shapiro, Jack M.; and Cline, Richard S., to Inland Steel Company. Automotive vehicle door and bar reinforcement. 4,796,946, Cl. 296-146.000.
Windmoller & Holscher: *See—*
Achelpohl, Fritz, 4,796,499, Cl. 83-151.000.
Windorski, David C., to Minnesota Mining and Manufacturing Company. Dispenser for a stack of notepaper. 4,796,781, Cl. 221-45.000.
Wing, Rodney G., to Rolls-Royce plc. Gas turbine engine rotor assembly. 4,796,343, Cl. 29-156.80R.
Winston, Robert H., to Creative Structures, Inc. Self-locking mortise and tenon joint. 4,797,020, Cl. 403-231.000.
Winter, Arthur: *See—*
Mascuch, Frank; and Winter, Arthur, 4,796,637, Cl. 128-658.000.
Winterrowd, Kenneth W.: *See—*
Lynde, Gerald D.; Winterrowd, Kenneth W.; and Harvey, Harold H., Jr., 4,796,709, Cl. 166-55.600.
Wisconsin Alumni Research Foundation: *See—*
Eyssa, Yehia M., 4,796,511, Cl. 89-8.000.
Wisecarver, Martin L. Clutch mechanism. 4,796,479, Cl. 74-398.000.
Wisotsky, Serge S., to Industrial Vehicles International, Inc. Seismic generator. 4,797,862, Cl. 367-143.000.
Wistling, Roger, to Aktiebolaget Bofors. Arrangement in one or more units disposed in an outer unit. 4,797,782, Cl. 361-384.000.
Witek, Francis A.; and Lake, David E., Jr., to Grass Valley Group, Inc., The. Image orientation and animation using quaternions. 4,797,836, Cl. 364-518.000.
Wittwer, Fitz: *See—*
Tschudi, Christoph; and Wittwer, Fitz, 4,797,587, Cl. 307-646.000.
Witty, Michael J.: *See—*
Gilligan, Paul J.; McGuirk, Paul R.; and Witty, Michael J., 4,797,490, Cl. 546-290.000.
Wolbrom, Irving M. Dye-containing porous plastic element and method of making it. 4,797,243, Cl. 264-126.000.
Wolf, Rudolf; and Vilsecker, Kurt, to Lenzing Aktiengesellschaft. Shed-forming apparatus for doup weave. 4,796,674, Cl. 139-13.00R.
Wolf, Theo: *See—*
Rademacher, Karl-Heinz; and Wolf, Theo, 4,797,760, Cl. 360-95.000.
Wolfe, Brian C.; and Wernholm, Thomas D., to Ford Motor Company. Automotive type throttle body. 4,796,579, Cl. 123-336.000.
Wolff, George: *See—*
Ellion, M. Edmund; Donatelli, Philip A.; and Wolff, George, 4,797,175, Cl. 156-644.000.
Wolfle, Wilfried: *See—*
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Woltersdorf, Otto W., Jr.; Cragoe, Edward J., Jr.; and Pietruszkiewicz, Adolph M., to Merck & Co., Inc. ((5,6-dichloro-3-oxo-9,9a-disubstituted-2,3,9,9a-tetrahydrofluoren-7-yl)oxy)alkanoic acids and alkanimidamides. 4,797,391, Cl. 514-120.000.
Wong, Mon N.; and Wong, Samuel S., to Hughes Aircraft Company. Coaxial hybrid coupler and crossing element. 4,797,643, Cl. 333-115.000.
Wong, Mon N.: *See—*
Kaplan, Sidney; and Wong, Mon N., 4,797,681, Cl. 343-786.000.
Wong, Raymond W.: *See—*
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Wood, Ruey E., Jr., to TRW Inc. Bearing for a joint. 4,797,019, Cl. 403-133.000.
Woodcock, William F.; and Kline, Loren H., to Colt Industries Inc. Tank mounted valve for fuel vapor recovery system. 4,796,593, Cl. 123-518.000.
Wright, Eric: *See—*
Farrar, Peter G. G.; Wright, Eric; and Peacock, Nicholas J., 4,796,424, Cl. 60-268.000.
Wright, Michael L.: *See—*
Barrow, Peter; and Wright, Michael L., 4,797,332, Cl. 429-104.000.
Wright, Robert L. Insert for batting tee and method of repairing a batting tee. 4,796,885, Cl. 273-26.00R.
Wu, Alexander F.; and Walters, Robert B., to Vulkor, Incorporated. Flame retardant wire with high insulation resistance. 4,797,323, Cl. 428-389.000.
Wu, Dan T.: *See—*
Pao, Liem T.; Yuen, Yeong H.; and Wu, Dan T., 4,796,821, Cl. 241-101.200.
Wu, Edwin S.: *See—*
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Wuerzer, Bruno: *See—*
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Wynn Oil Company: *See—*
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Wynne, Charles G., to National Research Development Corporation. Optical imaging systems. 4,796,984, Cl. 350-444.000.
Xerox Corporation: *See—*
Connell, G. A. Neville; and Kowalski, Daniel C., 4,796,964, Cl. 350-6.800.

Croucher, Melvin D.; Wong, Raymond W.; and Drappel, Stephan, 4,797,342, Cl. 430-137.000.
Doery, Michael S., 4,797,048, Cl. 412-11.000.
Ims, Dale R., 4,797,692, Cl. 346-140.00R.
Law, Kock-Yee; and Tarnawskyj, Ihor W., 4,797,337, Cl. 430-58.000.
Quate, Calvin F., 4,797,693, Cl. 346-140.00R.
Yaeli, Joseph, 4,797,894, Cl. 372-92.000.

Yaeli, Joseph, to Xerox Corporation. Alignment method and arrangement for external optical feedback for semiconductor diode lasers. 4,797,894, Cl. 372-92.000.

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Kadokura, Hidekimi; Sawara, Kenichi; and Yako, Tadaaki, 4,797,500, Cl. 556-1.000.

Yakovleva, Ljudmila S.: *See*—
Ivanov, Mikhail G.; Golov, Veniamin G.; Kuzmin, Vladimir N.; Alyakrinskaya, Aida I.; Musby, Roman Y.; Kovalev, Alexei D.; Shutova, Nadezhda V.; Rodionov, Jury A.; Molev, Igor I.; Yakovleva, Ljudmila S.; Berezin, Vitaly B.; Petrashko, Alexei I.; Shuev, Gennady M.; Bukin, Boris A.; Belkina, Tamara M., deceased; and Belkin, Naum S., administrator, 4,797,494, Cl. 548-374.000.

Yale Security Inc.: *See*—
Heid, George E., 4,796,931, Cl. 292-92.000.

Yalowitz, Charles I.; and Harris, Ronald D., to Texas Instruments Incorporated. Redundant device control unit. 4,797,884, Cl. 371-9.000.

Yamada, Hideji: *See*—
Tanaka, Akira; Nagao, Akira; Suzaki, Yukihiko; Yamada, Hideji; Nakajima, Toyohei; and Mieno, Toshiyuki, 4,796,586, Cl. 123-425.000.

Yamada, Kunio; and Ito, Masao, to Fuji Xerox Co., Ltd. Multi-beam scanning optical system. 4,796,961, Cl. 350-6.800.

Yamada, Masaji: *See*—
Hikuma, Hideo; and Yamada, Masaji, 4,796,462, Cl. 72-469.000.

Yamada, Masanori: *See*—
Sugishima, Kiyohisa; and Yamada, Masanori, 4,797,706, Cl. 355-14.00R.

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Takano, Yasuo; Tokoro, Hiroyoshi; Kobayashi, Junji; Yamada, Masato; Harada, Toshimitsu; and Hosoya, Kensei, 4,796,561, Cl. 118-657.000.

Yamada, Takeshi, to Shinpo Kabushiki Kaisha. Smokeless roaster. 4,796,601, Cl. 126-299.00R.

Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, to Takenaka Komuten Co., Ltd.; and Sinko Kogyo Co., Ltd. Air conditioning system. 4,796,439, Cl. 62-159.000.

Yamada, Toshihiko: *See*—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; and Sanada, Yuji, 4,797,088, Cl. 431-15.000.

Yamada, umito; Kawasaki, Hiroshi; and Satake, Masaki, to Fuji Photo Film Co., Ltd. Method for development of silver halide photographic materials utilizing reduced amounts of organic substances. 4,797,353, Cl. 430-434.000.

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Ito, Toshio; Miwa, Takashi; and Yamagishi, Fujio, 4,797,096, Cl. 433-26.000.

Yamaguchi, Akihiro: *See*—
Oikawa, Hideaki; Ohta, Masahiro; Kawashima, Saburo; Tamai, Shoji; Sonobe, Yoshiho; and Yamaguchi, Akihiro, 4,797,466, Cl. 528-185.000.

Yamaguchi Cinema Corporation: *See*—
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Yamaguchi, Katsumi; Yokoi, Syouichiro; Kanai, Takao; and Yoshikawa, Kikuo, to Clarion Co., Ltd. Pinch roller driving mechanism. 4,797,758, Cl. 360-85.000.

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Mizuguchi, Masaaki; and Kuroyanagi, Hirohisa, 4,796,509, Cl. 84-454.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electrode for electric discharge machining and method for producing the same. 4,797,527, Cl. 219-69.00E.

Yamamoto, Kiyoshi; Nakamura, Toshihiro; Ito, Tadao; and Inui, Keiichiro, to Shinto Paint Co. Ltd. Method of dissolving solid or semi-solid material into solvent. 4,797,230, Cl. 252-364.000.

Yamamoto, Masahiro: *See*—
Sasada, Shigeru; Yamamoto, Masahiro; Shimizu, Yoshio; and Sumioka, Tsutomu, 4,797,711, Cl. 355-32.000.

Yamamoto, Shirushi: *See*—
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Hatta, Naoyuki; Yoshihara, Hideo; Izaki, Takeshi; Sawada, Akihiro; Yamamoto, Takemi; and Sangyoji, Kazuo, 4,797,107, Cl. 434-408.000.

Yamamoto, Takeshi; Sasa, Nobumasa; and Nakano, Miegi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive composition for positive-type light-sensitive lithographic printing plates. 4,797,346, Cl. 430-192.000.

Yamamoto, Takeshi: *See*—
Fukutomi, Hisao; Tuchiya, Takanori; Yamamoto, Takeshi; Konishi, Takeshi; and Hamasaki, Iseo, 4,796,943, Cl. 296-65.100.

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Yamanaka, Osamu: *See*—
Kegasa, Koyo; Murai, Takafumi; Yamanaka, Osamu; and Fujii, Takeshi, 4,797,637, Cl. 331-4.000.

Yamanaka, Toshiaki: *See*—
Ishibashi, Koichiro; Minato, Osamu; Masuhara, Toshiaki; Sakai, Yoshio; Yamanaka, Toshiaki; Hashimoto, Naotaka; Hanamura, Shoji; Moriwaki, Nobuyuki; Honjyo, Shigeru; and Ueda, Kiyotsugu, 4,797,717, Cl. 357-23.100.

Yamaoka, Tadahiko: *See*—
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Yamasaki, Norikazu; and Koga, Keiichiro, to Kokusai Denshin Denwa Co., Ltd. Sequential decoding method and apparatus. 4,797,887, Cl. 371-43.000.

Yamashita, Kazunari: *See*—
Fujimoto, Sachito; and Yamashita, Kazunari, 4,796,589, Cl. 123-489.000.

Yamashita, Shoji, to I.B.E. Co., Ltd. Metal treated by a solution containing ferric ferrous salt. 4,797,156, Cl. 75-251.000.

Yamazaki, Hidetoshi: *See*—
Imai, Tooru; Mutou, Kouichi; Yamazaki, Hidetoshi; and Murata, Masae, 4,797,865, Cl. 369-39.000.

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Furukawa, Yasuo; Yamazaki, Katsuyuki; Hosaka, Takemi; and Fukui, Akira, 4,797,931, Cl. 351-56.000.

Yamazaki, Masuo: *See*—
Nakahara, Toshiaki; Ohsaki, Ichiro; Ushiyama, Hisayuki; Kiuchi, Masashi; Yamazaki, Masuo; Goseki, Yasuhide; and Ochi, Hisayuki, 4,797,344, Cl. 430-138.000.

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Yanai, Nabuya: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.

Yang, J. Leon, to Perkin-Elmer Corporation, The. LED monitoring without external light detection. 4,797,609, Cl. 324-158.00D.

Yang, Robert K.: *See*—
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., 4,797,288, Cl. 424-476.000.

Yano, Hironobu: *See*—
Hoki, Tetsuo; Sano, Tetsuo; Kitakado, Ryuji; Sezaki, Yoshinori; Hotta, Tomiji; and Yano, Hironobu, 4,797,939, Cl. 382-8.000.

Yardley, John P.: *See*—
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Yarwood, John C.: *See*—
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Yata, Masanori: *See*—
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Yates, Raymond: *See*—
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Yazaki Corporation: *See*—
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Ono, Mamoru; Naruse, Kohji; and Okazaki, Toshio, 4,797,513, Cl. 174-153.00G.

Yazawa, Kazunaga: *See*—
Kawai, Yasuo; Yazawa, Kazunaga; Suegara, Nobuo; and Shimohashi, Hirotaka, 4,797,278, Cl. 424-93.000.

Yazawa, Nobuyoshi, to Olympus Optical Co., Ltd. Imaging apparatus for endoscope. 4,797,737, Cl. 358-98.000.

Yecheskel, Herzel B.; Alon, Gad; and Beck, Eliezer. Treatment of cotton. 4,796,334, Cl. 19-0.270.

Yenser, Barbara A.: *See*—
Durfor, Charles N.; Bowers, Mark L.; and Yenser, Barbara A., 4,797,181, Cl. 204-1.00T.

Yissum Research and Development Company of the Hebrew University of Jerusalem: *See*—
Barenholz, Yechezkel; and Gabizon, Alberto, 4,797,285, Cl. 424-450.000.

Yokoi, Syouichiro: *See*—
Yamaguchi, Katsumi; Yokoi, Syouichiro; Kanai, Takao; and Yoshikawa, Kikuo, 4,797,758, Cl. 360-85.000.

Yokota, Akira: *See*—
Nakamura, Yoichi; Yamamoto, Shirushi; Komine, Takashi; Yokota, Akira; and Nakane, Hisashi, 4,797,348, Cl. 430-326.000.

Yokota, Hajime: *See*—
Nakaya, Rintaro; Okamura, Noboru; Kawashima, Takuji; Saito, Minoru; Yanai, Nabuya; Toida, Tomohiro; and Yokota, Hajime, 4,797,389, Cl. 514-54.000.

Yokota, Hiroshi: *See*—
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, 4,797,143, Cl. 65-3.120.
Yokoyama, Henry; Hsu, Wan-Jean; Poling, Stephen M.; and Hayman, Ernest P., to United States of America, Agriculture. Method of increasing biomass in plants. 4,797,153, Cl. 71-121.000.
Yokoyama, Masaru: *See*—
Ikuta, Shiro; Suyama, Eizo; Yokoyama, Masaru; and Yoshimura, Takeshi, 4,796,694, Cl. 165-152.000.
Yokoyama, Nobuaki: *See*—
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,797,636, Cl. 331-48.000.
Yokoyama, Toshio; Shimane, Iwao; and Konno, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing a position sensor for detecting angular position. 4,796,354, Cl. 29-608.000.
Yoon, Hyun-Nam: *See*—
Leslie, Thomas M.; Yoon, Hyun-Nam; DeMartino, Ronald N.; and Stamatoff, James B., 4,796,976, Cl. 350-330.000.
York, Thomas O.: *See*—
Linn, Edwards E.; and York, Thomas O., 4,797,273, Cl. 424-59.000.
Yoshida, Kenji: *See*—
Ohtaka, Hiroshi; Yoshida, Kenji; Sukuzi, Kenji; Shimohara, Koichi; Tajima, Sigeru; and Ito, Keizo, 4,797,400, Cl. 514-255.000.
Yoshida Kogyo K. K.: *See*—
Kondo, Hiroshi; Kusunoki, Toshimasa; and Kameda, Ryo, 4,796,519, Cl. 98-97.000.
Morita, Toyoo, 4,796,497, Cl. 83-23.000.
Yoshida, Shigeo; Kitagawa, Satoshi; Harada, Shozo; Koide, Tetsuya; and Hasegawa, Manabu, to National House Industrial Co., Ltd.; and INAX Corporation. Glazed cement product and method for manufacturing thereof. 4,797,319, Cl. 428-312.400.
Yoshida, Yashutoshi: *See*—
Yamada, Tetsuo; Inoue, Yoshinori; Miura, Sinji; Endo, Masao; Kaneda, Setsuo; and Yoshida, Yashutoshi, 4,796,439, Cl. 62-159.000.
Yoshihara, Hideki; and Warner, Nicholas M., to Unisys Corp. Method for positioning head in disk drive deriving "position" offset from "quadrature" signals. 4,797,756, Cl. 360-77.020.
Yoshihara, Hideo: *See*—
Hatta, Naoyuki; Yoshihara, Hideo; Izaki, Takeshi; Sawada, Akihiro; Yamamoto, Takemi; and Sangyoji, Kazuo, 4,797,107, Cl. 434-408.000.
Yoshikawa, Kikuo: *See*—
Yamaguchi, Katsumi; Yokoi, Syouichiro; Kanai, Takao; and Yoshikawa, Kikuo, 4,797,758, Cl. 360-85.000.
Yoshikawa, Shoji, to Olympus Optical Co., Ltd. Optical recording/reproducing apparatus. 4,797,866, Cl. 369-43.000.
Yoshimura, Shoji; Tani, Yoichiro; Matsuzaki, Youzi; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, to Mect Corporation. Process for preparing sialic acid derivatives. 4,797,477, Cl. 536-18.500.
Yoshimura, Takeshi: *See*—
Ikuta, Shiro; Suyama, Eizo; Yokoyama, Masaru; and Yoshimura, Takeshi, 4,796,694, Cl. 165-152.000.
Yoshimura, Tsuyoshi, to Ricoh Company, Ltd. Scanning apparatus using a rotary polygon mirror. 4,796,963, Cl. 350-6.800.
Yoshimura, Yoshinobu: *See*—
Miyake, Akio; Yoshimura, Yoshinobu; and Numata, Mitsuo, 4,797,395, Cl. 514-206.000.
Yoshinori Kidani: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,797,485, Cl. 544-225.000.
Yoshioka, Naoki: *See*—
Chida, Kazunori; Yokota, Hiroshi; Kyoto, Michihisa; Sato, Hisao; Watanabe, Minoru; and Yoshioka, Naoki, 4,797,143, Cl. 65-3.120.
Yoshizawa, Misuzu: *See*—
Uomi, Kazuhisa; Yoshizawa, Misuzu; Ono, Yuichi; Chinone, Naoki; and Kajimura, Takashi, 4,797,891, Cl. 372-46.000.
Young, John S.; Kruis, Peter; and Blewitt, William D., to GTE Communication Systems Corporation. Data format conversion circuit. 4,797,654, Cl. 341-50.000.
Yu, Edward K.; and Rogers, David W., to Acurex Corporation. Chaff dispenser system. 4,796,536, Cl. 102-505.000.
Yuen, Yeong H.: *See*—
Pao, Liem T.; Yuen, Yeong H.; and Wu, Dan T., 4,796,821, Cl. 241-101.200.
Yuken Kogyo Kabushiki Kaisha: *See*—
Hishinuma, Yasuo; and Ito, Hiroshi, 4,796,661, Cl. 137-487.500.
Yukihiko, Suzaki: *See*—
Suzuki, Yoshio; and Yukihiko, Suzaki, 4,797,828, Cl. 364-431.040.
Yunan, Malak E., to ETI Explosives Technologies International Inc. Primer assembly. 4,796,533, Cl. 102-322.000.
Zacher, H. Method of controlling a bowl-mill crusher. 4,796,817, Cl. 241-18.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Binger, Bernhard; Eickhoff, Hans J.; Maier, Paul; Engstler, Anton; and Grolig, Herbert, 4,796,486, Cl. 74-606.00R.
Zahuranec, Emery J.: *See*—
Musil, James C.; and Zahuranec, Emery J., 4,796,877, Cl. 269-87.200.
Zakai, Avi, to Mamtirim, Dan. Rotary irrigation sprinkler. 4,796,810, Cl. 239-222.170.
Zebco Corporation: *See*—
Councilman, Richard R., 4,796,828, Cl. 242-84.50A.
Zechmann, Jurgen: *See*—
Jonner, Wolf-Dieter; and Zechmann, Jurgen, 4,796,739, Cl. 192-13.00R.
Zelinka, Robert: *See*—
Hagin, Faust; Seethaler, Franz; Zelinka, Robert; and Stiglmaier, Manfred, 4,796,488, Cl. 74-713.000.
Zeyher, Craig H. Method of imparting energy to liquids. 4,796,427, Cl. 60-398.000.
Ziegler, Frederick J. Hinge mask. 4,796,330, Cl. 16-251.000.
Zillmer, Roger C.: *See*—
Sandiford, Burton B.; and Zillmer, Roger C., 4,796,700, Cl. 166-270.000.
Zimmer, Mark D., to Halliburton Company. Acoustic well logging system having multiplexed filter digitizing. 4,797,668, Cl. 340-857.000.
Zimmerman, Morris: *See*—
Finke, Paul E.; Zimmerman, Morris; Doherty, James B.; Ashe, Bonnie Mae; and Dorn, Conrad P., 4,797,396, Cl. 514-210.000.
Zimmermann, Robert H.: *See*—
Ochmann, Rudolf; and Zimmermann, Robert H., 4,797,905, Cl. 378-108.000.
Zinnen, Hermann A., to UOP Inc. Process for separating mono-, di-and triglycerides. 4,797,233, Cl. 260-428.500.
Zipperian, Thomas E.: *See*—
Chaffin, Roger J., deceased; Dawson, Ralph; Fritz, Ian J.; Osbourn, Gordon C.; and Zipperian, Thomas E., 4,797,716, Cl. 357-22.000.
Zucchi, Dario: *See*—
Bini, Dante; Bogliari, Domenico; Lomoro, Sandro; Minozzi, Daniele; Pietrogrande, Stefano; and Zucchi, Dario, 4,796,389, Cl. 52-2.000.
Zuniga, Gerardo: *See*—
Aguillen, Domingo V., Jr.; Casares, Pete P.; DeForrest, John E.; Green, Kevin C.; Kavanagh, Rocque A.; Wilkinson, Bryan; Marks, Marc K.; and Zuniga, Gerardo, 4,796,347, Cl. 29-280.000.
Zurn, Shayne M.: *See*—
Nelson, Hilding E.; Brown, Jeffrey O.; and Zurn, Shayne M., 4,797,838, Cl. 364-551.010.
Zweifel, Terry L.; and Johnson, David A., to Honeywill Inc. Flight guidance system for aircraft in windshear. 4,797,674, Cl. 340-968.000.
Zwicker, Fred. Safety retainer clip. 4,796,925, Cl. 285-114.000.
Zwirkoski, Lori J., to American Hospital Supply Corporation. Method and apparatus for in vitro calibration of oxygen saturation monitor. 4,796,633, Cl. 128-634.000.
Zyma SA: *See*—
Rimbault, Christian G., 4,797,414, Cl. 514-443.000.
501 Toppan Moore Company, Ltd.: *See*—
Watanabe, Hiroshi, 4,797,543, Cl. 235-492.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JANUARY, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Dental Technology, Inc.: *See*—
Bushway, Geoffrey C., Re. 32,824, Cl. 433-221.000.

American Cyanamid: *See*—
Fu, Yun-Lung; and Wang, Samuel S., Re. 32,827, Cl. 252-61.000.

Bushway, Geoffrey C., to Advanced Dental Technology, Inc. Premade reinforcement device. Re. 32,824, Cl. 433-221.000.

Cerberus A.G.: *See*—
Mudge, Philip H., Re. 32,828, Cl. 250-342.000.

Dahlby, Larry C., to S. C. Johnson & Son, Inc. Apparatus and method for segregating parts. Re. 32,823, Cl. 209-616.000.

E. I Du Pont de Nemours and Company: *See*—
Linder, Karen E., Re. 32,826, Cl. 424-1.100.

Fu, Yun-Lung; and Wang, Samuel S., to American Cyanamid. Neutral hydrocarboxycarbonyl thionocarbamate sulfide collectors. Re. 32,827, Cl. 252-61.000.

General Instrument Corp.: *See*—
McCann, T. Michael, Re. 32,829, Cl. 361-436.000.

Green, Glen R.: *See*—
Hodges, Joseph L.; and Green, Glen R., Re. 32,822, Cl. 83-402.000.

Hodges, Joseph L.; and Green, Glen R. Potato strip cutter. Re. 32,822, Cl. 83-402.000.

Hull, Michael N.; and Yasnovsky, Vacheslav M., to International Paper Company. Process for the electrochemical reductive bleaching of lignocellulosic pulp. Re. 32,825, Cl. 162-50.000.

International Paper Company: *See*—
Hull, Michael N.; and Yasnovsky, Vacheslav M., Re. 32,825, Cl. 162-50.000.

Linder, Karen E., to E. I Du Pont de Nemours and Company. Cationic technetium complexes useful as radiodiagnostic agents. Re. 32,826, Cl. 424-1.100.

McCann, T. Michael, to General Instrument Corp. Rectifier with slug construction and mold for fabricating same. Re. 32,829, Cl. 361-436.000.

Mudge, Philip H., to Cerberus A.G. Passive infrared intrusion detection system. Re. 32,828, Cl. 250-342.000.

S. C. Johnson & Son, Inc.: *See*—
Dahlby, Larry C., Re. 32,823, Cl. 209-616.000.

Wang, Samuel S.: *See*—
Fu, Yun-Lung; and Wang, Samuel S., Re. 32,827, Cl. 252-61.000.

Yasnovsky, Vacheslav M.: *See*—
Hull, Michael N.; and Yasnovsky, Vacheslav M., Re. 32,825, Cl. 162-50.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Billmayer, Charles E.; and Koch, Robert P., to Leisure Life Limited. Manually powered boat. B1 4,668,196, 1-10-89, Cl. 440-26.000.

Boyd, Douglas P., to Leland Stanford, Jr. University, The Board of Trustees of. Position sensitive X-ray or γ-ray detector and 3-D tomography using same. B1 4,075,491, 1-10-89, Cl. 378-19.000.

Breckner, Raymond A. Apparatus and method for handling solids in liquid. B1 4,517,099, 1-10-89, Cl. 210-741.000.

Fuji Photo Film Co., Ltd.: *See*—
Mukai, Kazuo; Honjoh, Akira; and Nakata, Shuji, B1 4,656,790, Cl. 51-141.000.

Honjoh, Akira: *See*—
Mukai, Kazuo; Honjoh, Akira; and Nakata, Shuji, B1 4,656,790, Cl. 51-141.000.

Koch, Robert P.: *See*—
Billmayer, Charles E.; and Koch, Robert P., B1 4,668,196, Cl. 440-26.000.

Leisure Life Limited: *See*—
Billmayer, Charles E.; and Koch, Robert P., B1 4,668,196, Cl. 440-26.000.

Leland Stanford, Jr. University, The Board of Trustees of: *See*—
Boyd, Douglas P., B1 4,075,491, Cl. 378-19.000.

Mukai, Kazuo; Honjoh, Akira; and Nakata, Shuji, to Fuji Photo Film Co., Ltd. Burnishing method and apparatus for magnetic disk. B1 4,656,790, 1-10-89, Cl. 51-141.000.

Nakata, Shuji: *See*—
Mukai, Kazuo; Honjoh, Akira; and Nakata, Shuji, B1 4,656,790, Cl. 51-141.000.

LIST OF DESIGN PATENTEES

Abbott, Dona L., to Highland Supply Corporation. Florist foil or similar article. 299,290, 1-10-89, Cl. D5-46.000.

Abe, Yoshinori: *See*—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 299,334, Cl. D13-4.000.

ACS Communications, Inc.: *See*—
Stevens, Toni R., 299,344, Cl. D14-249.000.

Adams Hard-Facing Company, Inc.: *See*—
Edmisson, Delmar D., 299,350, Cl. D15-29.000.
Edmisson, Delmar D., 299,351, Cl. D15-29.000.

Armatron International, Inc.: *See*—
Cunning, Joseph M., 299,349, Cl. D15-28.000.

Arnold, Merrill G. Puzzle. 299,366, 1-10-89, Cl. D21-104.000.

Attwood Corporation: *See*—
Whitley, Warwick M., II, 299,311, Cl. D8-356.000.

AVIA Group International, Inc.: *See*—
Selbiger, Lawrence, 299,283, Cl. D2-314.000.

Baker, Leslie D. Doll. 299,368, 1-10-89, Cl. D21-171.000.

Baptiste, Trevor I. Combination shirt and bow tie. 299,281, 1-10-89, Cl. D2-209.000.

Bernstein, Lawrence A. Wheelchair. 299,326, 1-10-89, Cl. D12-131.000.

Brookes, Richard L. Self-sanitizing door handle. 299,309, 1-10-89, Cl. D8-300.000.

Brooks, Steve. Game board. 299,363, 1-10-89, Cl. D21-31.000.

Brown, Paul D.; and Diaz, Juan A., to Reebok Group International Ltd. Athletic shoe upper. 299,284, 1-10-89, Cl. D2-314.000.

Buchin, Karl, to Krone AG. Handset transceiver and telephone dialer stand with display panel. 299,342, 1-10-89, Cl. D14-151.000.

Burrows, Vernon R. Fishing lure. 299,376, 1-10-89, Cl. D22-129.000.

Bussell, Vanda J. Shower curtain holder or similar article. 299,313, 1-10-89, Cl. D8-373.000.

Cain, Ann S., to 'Totes', Incorporated. Portable desk tool kit. 299,359, 1-10-89, Cl. D19-75.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Garnich, Rolf; and Leurs, Hermann, 299,357, Cl. D16-131.000.

Carretta, Fredinando, to Pirelli S.A. Companhia Industrial Brasileira. Tire tread surface pattern. 299,332, 1-10-89, Cl. D12-147.000.

Chan, Ying K., to Scientific Toys Limited. Toy vehicle. 299,367, 1-10-89, Cl. D21-134.000.

Chiang, John A. Alternating current sensing device. 299,318, 1-10-89, Cl. D10-78.000.

Chonan, Katsuhiko: *See*—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 299,334, Cl. D13-4.000.
Clunk, Ronald I.: *See*—
Wallet, Bill J.; and Clunk, Ronald I., 299,329, Cl. D12-146.000.
Conoco Inc.: *See*—
LeFevre, Louis B., 299,314, Cl. D9-370.000.
Corning Glass Works: *See*—
Prindle, William A., 299,308, Cl. D8-93.000.
Coue, Maurice E. L., to Huret et ses Fils, S.A. of Chepy. Derailleur actuating handle unit. 299,333, 1-10-89, Cl. D12-179.000.
Cunning, Joseph M., to Armatron International, Inc. Housing for leaf shredder. 299,349, 1-10-89, Cl. D15-28.000.
Dahle, Dennis F. Level. 299,317, 1-10-89, Cl. D10-69.000.
Deutsche Telephonwerke und Kabelindustrie Aktiengesellschaft: *See*—
Friedrich, Georg, 299,343, Cl. D14-151.000.
Diaz, Juan A.: *See*—
Brown, Paul D.; and Diaz, Juan A., 299,284, Cl. D2-314.000.
Diehl, Patrick. Chest. 299,295, 1-10-89, Cl. D6-434.000.
Digital Equipment Corporation: *See*—
Landry, Christian C.; and Faranda, Robert T., 299,347, Cl. D14-113.000.
Don Evans, Inc.: *See*—
Lothe, Arlan D., 299,361, Cl. D19-90.000.
Drackett Company, The: *See*—
Machacek, Robert W., 299,289, Cl. D4-134.000.
Durand, Jean-Jacques. Wine glass or similar article. 299,298, 1-10-89, Cl. D7-11.000.
Durand, Jean-Jacques. Stemmed wine glass or similar article. 299,299, 1-10-89, Cl. D7-13.000.
Durand, Jean-Jacques. Vase or similar article. 299,319, 1-10-89, Cl. D11-153.000.
Durand, Jean-Jacques. Vase or similar article. 299,320, 1-10-89, Cl. D11-153.000.
Eastman Kodak Company: *See*—
Walters, Michael A., 299,346, Cl. D14-111.000.
Edmisson, Delmar D., to Adams Hard-Facing Company, Inc. Overcap point for tillage tool. 299,350, 1-10-89, Cl. D15-29.000.
Edmisson, Delmar D., to Adams Hard-Facing Company, Inc. Shank tip insert for tillage tool. 299,351, 1-10-89, Cl. D15-29.000.
Faranda, Robert T.: *See*—
Landry, Christian C.; and Faranda, Robert T., 299,347, Cl. D14-113.000.
Faulconer, Mark; and Greatrake, Scott E., to U.S. Divers Company, Inc. Diver's buoyancy compensator backpack support. 299,286, 1-10-89, Cl. D3-32.000.
Fildan, Gerhard. Cord lock. 299,310, 1-10-89, Cl. D8-356.000.
Finnigan, Fred D. Tomato plant support tie for attachment to a stake. 299,307, 1-10-89, Cl. D8-1.000.
Firestone Tire & Rubber Company, The: *See*—
Lyle, William W.; and Sladky, Donald J., 299,328, Cl. D12-146.000.
Wallet, Bill J.; and Clunk, Ronald I., 299,329, Cl. D12-146.000.
Wallet, Bill J., 299,330, Cl. D12-147.000.
Wallet, Bill J., 299,331, Cl. D12-147.000.
Foy, Hunter T.; and Martin, Randall W., to International Business Machines Corp. Automotive test terminal. 299,345, 1-10-89, Cl. D14-102.000.
Frabill, Inc.: *See*—
Martin, Jeffery G., 299,378, Cl. D22-136.000.
Friedrich, Georg, to Deutsche Telephonwerke und Kabelindustrie Aktiengesellschaft. Telephone communication terminal set. 299,343, 1-10-89, Cl. D14-151.000.
Garcia, Jose A. M. Fishing rod light. 299,377, 1-10-89, Cl. D22-134.000.
Garnich, Rolf; and Leurs, Hermann, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Microscope. 299,357, 1-10-89, Cl. D16-131.000.
Gertler, Bernard H. Truck cab storage compartment. 299,287, 1-10-89, Cl. D3-40.000.
Goldstein, Joseph. Handle for roll of plastic film. 299,353, 1-10-89, Cl. D15-145.000.
Graf, Larry J.: *See*—
Smith, David B.; Graf, Larry J.; and Miller, Randolph F., 299,369, Cl. D21-191.000.
Grant, Pearl A.: *See*—
Spaulding, Richard A.; and Grant, Pearl A., 299,352, Cl. D15-144.000.
Gray, Stephen W. Disposable funnel. 299,302, 1-10-89, Cl. D7-68.000.
Greatrake, Scott E.: *See*—
Faulconer, Mark; and Greatrake, Scott E., 299,286, Cl. D3-32.000.
Greeley, Patrick M. Hand holdable aquatic exerciser. 299,365, 1-10-89, Cl. D21-191.000.
Green, Ernest Eugene: *See*—
Laessle, William B., 299,312, Cl. D8-367.000.
Grosfillex, Raymond, to Grosfillex S.A.R.L. Adjustable armchair. 299,292, 1-10-89, Cl. D6-367.000.
Grosfillex S.A.R.L.: *See*—
Grosfillex, Raymond, 299,292, Cl. D6-367.000.
Haggerty, Peter D.; and Rayl, Eric L. Air valve closure for inflatable article. 299,379, 1-10-89, Cl. D23-249.000.
Hattori, Yasuo: *See*—
Osanai, Akira; Kato, Toshikazu; and Hattori, Yasuo, 299,336, Cl. D14-225.000.
Hauser, Michael A.: *See*—
Parker, Matthew L.; and Hauser, Michael A., 299,373, Cl. D21-196.000.
Highland Supply Corporation: *See*—
Abbott, Dona L., 299,290, Cl. D5-46.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Oba, Yasuhiro; Yamamoto, Mitsuru; and Watanabe, Akira, 299,324, Cl. D12-86.000.
Oshika, Toshi; Ichinose, Kazuhiro; and Kurosu, Yukio, 299,325, Cl. D12-92.000.
Huret et ses Fils, S.A. of Chepy: *See*—
Coue, Maurice E. L., 299,333, Cl. D12-179.000.
Ichinose, Kazuhiro: *See*—
Oshika, Toshi; Ichinose, Kazuhiro; and Kurosu, Yukio, 299,325, Cl. D12-92.000.
Iinuma, Hideo: *See*—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 299,334, Cl. D13-4.000.
International Business Machines Corp.: *See*—
Foy, Hunter T.; and Martin, Randall W., 299,345, Cl. D14-102.000.
Ito, Eiji: *See*—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 299,334, Cl. D13-4.000.
Jones, William O. Gameboard. 299,364, 1-10-89, Cl. D21-34.000.
Kato, Toshikazu: *See*—
Osanai, Akira; Kato, Toshikazu; and Hattori, Yasuo, 299,336, Cl. D14-225.000.
Keepsakes Time Capsules, Inc.: *See*—
MacDonald, Roderick D., 299,315, Cl. D9-398.000.
Kenda Rubber Industrial Co., Ltd.: *See*—
Miller, Glynne D., 299,327, Cl. D12-140.000.
Klodt, Gerald J., to W. T. Rogers Company. Vertical file or the like. 299,360, 1-10-89, Cl. D19-90.000.
Knochner, Michael; and Lang, Manfred, to Rowenta-Werke GmbH. Espresso machine. 299,304, 1-10-89, Cl. D7-309.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Power inverter. 299,334, 1-10-89, Cl. D13-4.000.
Kosako, Mikio; and Nishibori, Hiroshi, to Sharp Corporation. Copying machine. 299,355, 1-10-89, Cl. D18-39.000.
Krone AG: *See*—
Buchin, Karl, 299,342, Cl. D14-151.000.
Kurosu, Yukio: *See*—
Oshika, Toshi; Ichinose, Kazuhiro; and Kurosu, Yukio, 299,325, Cl. D12-92.000.
Kverneland A/S: *See*—
Nja, Olav, 299,348, Cl. D15-11.000.
Laessle, William B., to Green, Ernest Eugene, a part interest. Combined hook and bolt therefor. 299,312, 1-10-89, Cl. D8-367.000.
Lafko, Bruce C. Combined dresser and mirror. 299,296, 1-10-89, Cl. D6-444.000.
Landry, Christian C.; and Faranda, Robert T., to Digital Equipment Corporation. Display terminal. 299,347, 1-10-89, Cl. D14-113.000.
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Shoesmith, Leonard H., deceased (by Shoesmith, May Victoria, executrix); and Hesse, Peter S., to Ball Pan Am Plant Company. Chrysanthemum plant named Cadet. 6,530, 1-10-89, Cl. 78.000.

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NOTE.—First number, class; second number, subclass; third number, patent number

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500 4,796,564
657 4,796,561
725 4,796,562

CLASS 119

28 4,796,563
101 4,796,565
124 4,796,566
158 4,796,567

CLASS 122

4 D 4,796,568
6 A 4,796,569
7 R 4,796,570

CLASS 123

41.12 4,796,571
41.42 4,796,572
90.16 4,796,573
90.23 4,796,574
90.43 4,796,576
90.44 4,796,575
300 4,796,577
336 4,796,579
339 4,796,580
373 4,796,581
378 4,796,578
4,796,582
4,796,583
403 4,796,584
409 4,796,585
425 4,796,586
440 4,796,587
479 4,796,588
489 4,796,589
4,796,590
492 4,796,591
502 4,796,592
518 4,796,593
531 4,796,594
559.2 4,796,595
593 4,796,596

CLASS 124

25 4,796,598
41 A 4,796,597

CLASS 126

30 4,796,599
39.5 4,796,602
273 H 4,796,600
299 R 4,796,601

CLASS 128

4 4,796,607
6 4,796,604
24 A 4,796,608
4,796,613
57 4,796,616
74 4,796,609
80 C 4,796,610
87 R 4,796,611
92 YF 4,796,612
200.14 4,796,614
202.27 4,796,615
204.19 4,796,619
204.25 4,796,617
204.26 4,796,618
206.23 4,796,621
303.1 4,796,622
305 4,796,623
316 4,796,624
325 4,796,625
334 R 4,796,626
337 4,796,627
344 4,796,629
360 4,796,628
419 D 4,796,630
421 4,796,631
633 4,796,636
634 4,796,633
653 4,796,635
658 4,796,637
662.01 4,796,634
662.03 4,796,632
696 4,796,638
706 4,796,620
719 4,796,639
736 4,796,640
748 4,796,641
760 4,796,644
772 4,796,642
785 4,796,643
899 4,796,603

CLASS 130

27 HA 4,796,645

CLASS 132

202 4,796,646
320 4,796,647

CLASS 135

102 4,796,649

CLASS 137

8 4,796,651
78.3 4,796,654
83 4,796,655
106 4,796,656
116.3 4,796,652
119 4,796,657
312 4,796,658
341 4,796,653
443 4,796,650
487.5 4,796,661
492 4,796,659
504 4,796,660
515.5 4,796,663
595 4,796,664
596.16 4,796,662
614.13 4,796,665
625.17 4,796,666
629 4,796,667

CLASS 138

65 4,796,648
96 T 4,796,668
97 4,796,669
4,796,673
110 4,796,670
140 4,796,671
154 4,796,672

CLASS 139

13 R 4,796,674
452 4,796,675

CLASS 141

83 4,796,676
88 4,796,677
206 4,796,678
258 4,796,679

CLASS 144

2 R 4,796,680
212 4,796,681
371 4,796,682

CLASS 148
2 4,797,164
12.7 A 4,797,165
13.1 4,797,166
111 4,797,167

CLASS 149
88 4,797,168

CLASS 152
209 R 4,796,683

CLASS 156
64 4,797,169
71 4,797,170
322 4,797,171
425 4,797,172
498 4,797,173
616.1 4,797,174
630 4,797,177
643 4,797,178
644 4,797,175
647 4,797,179

CLASS 160
330 4,796,684

CLASS 162
50 Re.32,825
135 4,797,176

CLASS 164
203 4,796,685
287 4,796,686
455 4,796,687
457 4,796,688
503 4,796,689

CLASS 165
67 4,796,690
104.16 4,796,691
129 4,796,692
133 4,796,693
152 4,796,694
159 4,796,695
169 4,796,696

CLASS 166
55.6 4,796,709
90 4,796,697
135 4,796,698
250 4,796,699
270 4,796,700
278 4,796,701
308 4,796,702
312 4,796,703
317 4,796,704
323 4,796,705
380 4,796,706
386 4,796,708
387 4,796,707
437 4,797,163

CLASS 169
38 4,796,710

CLASS 171
1 4,796,711

CLASS 172
7 4,796,712

CLASS 174
48 4,797,507
68.5 4,797,508
84 C 4,797,509
94 R 4,797,510
110 PM 4,797,511
135 4,797,512
153 G 4,797,513

CLASS 175
96 4,796,713

CLASS 178
18 4,797,514

CLASS 180
143 4,796,714
4,796,715
176 4,796,716
197 4,796,717
4,796,718
219 4,796,719
234 4,796,720
294 4,796,721
297 4,796,722

CLASS 181
102 4,796,723
106 4,796,724
123 4,796,726
142 4,796,725

CLASS 182
168 4,796,727

CLASS 188
18 A 4,796,728
71.6 4,796,730
71.7 4,796,729
196 D 4,796,731
282 4,796,732
291 4,796,733

CLASS 190
1 4,796,734
109 4,796,735

CLASS 192
4 C 4,796,736
13 R 4,796,739
18 R 4,796,737
20 4,796,738
30 V 4,796,740
53 E 4,796,741
67 P 4,796,742
98 4,796,743

CLASS 198
397 4,796,744
407 4,796,745
463.4 4,796,746
535 4,796,747
711 4,796,748
851 4,796,749

CLASS 200
38 R 4,797,515
51 R 4,797,516
60 4,797,517
61.89 4,797,518
144 B 4,797,522
226 4,797,519
295 4,797,520

CLASS 204
1 T 4,797,180
4,797,181
14.1 4,797,182
16 4,797,183
59 R 4,797,184
129 4,797,185
4,797,186
180.2 4,797,187
224 M 4,797,189
296 4,797,190
411 4,797,191
412 4,797,192
414 4,797,188
416 4,797,193
425 4,797,194

CLASS 206
37.4 4,796,750
223 4,796,751
315.3 4,796,752
387 4,796,753
434 4,796,754
444 4,796,755
454 4,796,756
509 4,796,757
545 4,796,758
554 4,796,759
606 4,796,760

CLASS 208
59 4,797,195
4,797,196
131 4,797,197
181 4,797,198
262.1 4,797,199
308 4,797,200

CLASS 209
127.4 4,797,201
166 4,797,202
211 4,797,203
237 4,797,204
616 Re.32,823

CLASS 210
86 4,797,205
169 4,797,206
198.2 4,797,207
242.3 4,797,210
321.84 4,797,211
606 4,797,208
614 4,797,212
651 4,797,213
4,797,214
656 4,797,209
658 4,797,215
741 B1 4,517,099

CLASS 211
11 4,796,761
64 4,796,762
133 4,796,763
184 4,796,764

CLASS 212
205 4,796,765

CLASS 215
1 C 4,796,766
11.1 4,796,767
207 4,796,768
232 4,796,769
252 4,796,770
253 4,796,771

CLASS 219
10.55 E 4,797,521
4,797,523
10.69 4,797,524
10.79 4,797,525
69 E 4,797,527
69 W 4,797,526
70 4,797,528
99 4,797,529
121.67 4,797,531
121.74 4,797,532
121.85 4,797,530
225 4,797,533
326 4,797,534
338 4,797,535
494 4,797,536
528 4,797,537

CLASS 220
22 4,796,773
66 4,796,772
90.4 4,796,774
92 4,796,775
203 4,796,776
4,796,777
315 4,796,778

CLASS 221
36 4,796,779
45 4,796,781
154 4,796,780

CLASS 222
57 4,796,782
64 4,796,787
80 4,796,783
4,796,784
94 4,796,788
131 4,796,785
256 4,796,786

CLASS 224
202 4,796,789
253 4,796,790
275 4,796,791

CLASS 225
72 4,796,792

CLASS 227
156 4,796,794

CLASS 228
20 4,796,795
37 4,796,796
144 4,796,797
146 4,796,798
155 4,796,799

CLASS 229
5.7 4,796,800
104 4,796,801
108 4,796,802

CLASS 235
1 D 4,797,538
85 R 4,797,539
380 4,797,542
383 4,797,540
449 4,797,541
492 4,797,543

CLASS 236
49 4,796,803

CLASS 239
1 4,796,804
2.2 4,796,805
11 4,796,806
102.2 4,796,807
175 4,796,808
205 4,796,809
222.17 4,796,810
4,796,811
303 4,796,812
425 4,796,813
430 4,796,814
477 4,796,815
501 4,796,816

CLASS 241
18 4,796,817
69 4,796,820
85 4,796,818
92 4,796,819
101.2 4,796,821
275 4,796,822

CLASS 242
55.3 4,796,832
55.53 4,796,825
71.8 4,796,823
76 4,796,824
84.5 A 4,796,828
86.5 R 4,796,826
96 4,796,827
100 4,796,829
117 4,796,830
212 4,796,831

CLASS 244
3.12 4,796,833
3.16 4,796,834
3.29 4,796,835
23 R 4,796,836
122 R 4,796,837
135 A 4,796,838
158 R 4,796,839
215 4,796,840

CLASS 248
60 4,796,841
71 4,796,848
168 4,796,843
186 4,796,842
222.2 4,796,844
243 4,796,845
286 4,796,846
441.1 4,796,847
619 4,796,849
674 4,796,850

CLASS 249
91 4,796,851

CLASS 250
201 4,797,545
214 R 4,797,546
221 4,797,544
4,797,547
4,797,548
227 4,797,549
4,797,550
4,797,559
234 4,797,551
251 4,797,552
287 4,797,554
327.2 4,797,553
336.1 4,797,555
342 Re.32,828
551 4,797,556
561 4,797,557
572 4,797,558
578 4,797,560
4,797,561
4,797,562

CLASS 251
129.05 4,796,853
129.07 4,796,854
129.15 4,796,855
149.5 4,796,856
171 4,796,858
173 4,796,857
297 4,796,860

CLASS 252
8.551 4,797,216
42.7 4,797,217
47.5 4,797,218
56 D 4,797,219
61 Re.32,827
83 4,797,220
95 4,797,221
105 4,797,225
174.21 4,797,222
174.23 4,797,223
181 4,797,224
182.2 4,797,226
194 4,797,227
299.63 4,797,228
345 4,797,229
364 4,797,230
547 4,797,231
629 4,797,232

CLASS 254
8 B 4,796,861
134.3 FT 4,796,865
277 4,796,862
337 4,796,863
425 4,796,864

CLASS 256
59 4,796,866

CLASS 260
428.5 4,797,233

CLASS 264
4.1 4,797,234
22 4,797,235
40.1 4,797,236
45.3 4,797,237
45.5 4,797,239
46.4 4,797,240
63 4,797,241
65 4,797,238
108 4,797,242
126 4,797,243
266 4,797,244
328.4 4,797,245
504 4,797,246

CLASS 266
51 4,796,867
4,796,868
271 4,796,869

CLASS 267
35 4,796,870
64.11 4,796,871
103 4,796,872
136 4,796,873
140.1 4,796,874
4,796,875
4,796,876

CLASS 269
87.2 4,796,877

CLASS 271
10 4,796,878
218 4,796,879
311 4,796,880

CLASS 272
72 4,796,881
4,796,882
93 4,796,883
113 4,796,884

CLASS 273
26 R 4,796,885
29 A 4,796,886
51 4,796,887
58 R 4,796,888
73 J 4,796,889
144 B 4,796,890
153 S 4,796,891
183 E 4,796,892
201 4,796,893
244 4,796,894

CLASS 277
4 4,796,895
19 4,796,793
181 4,796,896
211 4,796,897
216 4,796,898
228 4,796,899

CLASS 279
123 4,796,900

CLASS 280
5 A 4,796,901
16 4,796,902
87.02 W 4,796,903
91 4,796,904
154.5 R 4,796,905
4,796,906
220 4,796,907
615 4,796,908
651 4,796,909
689 4,796,911
715 4,796,910
736 4,796,912
731 4,796,913
757 4,796,914
802 4,796,915
803 4,796,916
804 4,796,917
806 4,796,918
808 4,796,919

CLASS 283
34 4,796,920
91 4,796,921

CLASS 285
26 4,796,922
27 4,796,923
39 4,796,924
114 4,796,925
181 4,796,926
190 4,796,927
334 4,796,928

CLASS 290
54 4,797,563

CLASS 292
28 4,796,929
58 4,796,930
92 4,796,931
112 4,796,932
265 4,796,933
336.3 4,796,934

CLASS 293
128 4,796,935

CLASS 294
31.2 4,796,936
4,796,937
55 4,796,938
67.1 4,796,939
171 4,796,940

CLASS 296
3 4,796,941
39.2 4,796,942
65.1 4,796,943
97.5 4,796,944
100 4,796,945
146 4,796,946
223 4,796,947

CLASS 297
239 4,796,949
284 4,796,948
302 4,796,950
337 4,796,951
340 4,796,952
400 4,796,953
452 4,796,954
4,796,955

CLASS 299
69 4,796,956

CLASS 303
113 4,796,958
116 4,796,957
119 4,796,959

CLASS 307
43 4,797,566
66 4,797,567
87 4,797,570
119 4,797,564
141 4,797,568
269 4,797,572
4,797,573
4,797,574
272.1 4,797,575
4,797,576
297 4,797,569
4,797,577
303 4,797,578
311 4,797,571
443 4,797,579
450 4,797,565
451 4,797,580
475 4,797,581
4,797,582
4,797,583
594 4,797,584
4,797,585
603 4,797,586
646 4,797,587

CLASS 310
54 4,797,588
68 D 4,797,590
103 4,797,591
154 4,797,592

CLASS 312
305 4,796,960

CLASS 313
346 R 4,797,593
488 4,797,594
493 4,797,595

CLASS 315
5.13 4,797,596
39 4,797,597
85 4,797,598
194 4,797,599

CLASS 318
254 4,797,600
443 4,797,601

CLASS 322
10 4,797,602

CLASS 324
60 CD 4,797,603
65 R 4,797,604
4,797,605
71.1 4,797,606
96 4,797,607
4,797,608
158 D 4,797,609
158 F 4,797,610
173 4,797,612
208 4,797,611
220 4,797,613
236 4,797,614
309 4,797,615
4,797,616
322 4,797,617
326 4,797,618
409 4,797,619
458 4,797,620
533 4,797,621
537 4,797,622
556 4,797,623

CLASS 338
114 4,797,624
133 4,797,625

225 4,797,626
CLASS 330
2 4,797,627
54 4,797,628
253 4,797,631
258 4,797,629
264 4,797,630
285 4,797,632
297 4,797,633
CLASS 331
4 4,797,637
12 4,797,634
17 4,797,635
48 4,797,636
117 D 4,797,638
158 4,797,639
CLASS 332
7.51 4,797,640
4,797,641
CLASS 333
22 R 4,797,642
115 4,797,643
CLASS 335
230 4,797,645
301 4,797,646
CLASS 336
175 4,797,647
192 4,797,648
CLASS 337
140 4,797,649
CLASS 340
146.2 4,797,650
4,797,651
4,797,652
521 4,797,655
539 4,797,656
541 4,797,657
551 4,797,658
572 4,797,659
583 4,797,660
606 4,797,666
664 4,797,661
677 4,797,662
691 4,797,663
693 4,797,664
710 4,797,665
781 4,797,667
825.170 4,797,670
825.300 4,797,672
825.490 4,797,671
857 4,797,668
870.40 4,797,669
904 4,797,673
968 4,797,674
CLASS 341
50 4,797,654
51 4,797,653
CLASS 342
28 4,797,675
176 4,797,676
352 4,797,677
4,797,678
387 4,797,679
CLASS 343
705 4,797,680
786 4,797,681
844 4,797,682
872 4,797,683
895 4,797,684
912 4,797,685
CLASS 346
1.1 4,797,686
4,797,687
75 4,797,688
76 PH 4,797,689
105 4,797,690
108 4,797,691
140 R 4,797,692
4,797,693
160 4,797,694
4,797,695
CLASS 350
1.1 4,796,973
6.8 4,796,961
4,796,962
4,796,963
4,796,964
4,796,965
96.10 4,796,967
96.15 4,796,968
96.18 4,796,969
96.2 4,796,966
96.23 4,796,970
96.34 4,796,971
99 4,796,972
247 4,796,974
320 4,796,975
330 4,796,976
331 R 4,796,977
337 4,796,978
350 S 4,796,979
4,796,980
353 4,796,981
356 4,796,982
376 4,796,983
444 4,796,984
523 4,796,985
CLASS 351
56 4,797,931
57 4,796,986
158 4,796,987
169 4,796,988
212 4,796,989
245 4,796,859
CLASS 352
89 4,796,990
CLASS 384
4 4,797,696
75 4,797,697
246 4,797,699
271.1 4,797,700
275 4,797,698
288 4,797,701
413 4,797,702
CLASS 355
3 DD 4,797,703
4,797,704
10 4,797,644
14 CH 4,797,705
14 R 4,797,706
4,797,707
15 4,797,708
27 4,797,709
4,797,710
32 4,797,711
38 4,797,712
77 4,797,713
4,797,714
CLASS 356
125 4,796,991
347 4,796,992
350 4,796,993
358 4,796,994
368 4,796,995
372 4,796,996
376 4,796,997
4,796,998
394 4,796,999
436 4,797,000
CLASS 357
17 4,797,715
22 4,797,716
23.1 4,797,717
23.4 4,797,718
23.6 4,797,719
23.7 4,797,721
34 4,797,722
39 4,797,720
40 4,797,723
42 4,797,724
54 4,797,725
70 4,797,726
79 4,797,727
81 4,797,728
CLASS 358
13 4,797,729
17 4,797,731
19 4,797,730
28 4,797,732
29 4,797,733
55 4,797,734
86 4,797,735
93 4,797,736
98 4,797,737
101 4,797,738
133 4,797,739
136 4,797,740
138 4,797,741
140 4,797,746
141 4,797,742
149 4,797,743
164 4,797,744
169 4,797,745
217 4,797,747
257 4,797,748
302 4,797,749
335 4,797,750
4,797,751
342 4,797,752
CLASS 360
27 4,797,753
48 4,797,754
49 4,797,755
77.02 4,797,756
77.08 4,797,757
85 4,797,758
92 4,797,759
95 4,797,760
99.06 4,797,761
4,797,762
99.08 4,797,769
104 4,797,763
110 4,797,765
113 4,797,766
121 4,797,767
132 4,797,768
135 4,797,764
CLASS 361
42 4,797,772
58 4,797,773
86 4,797,774
88 4,797,771
93 4,797,775
103 4,797,776
115 4,797,777
130 4,797,778
154 4,797,779
321 4,797,780
332 4,797,781
384 4,797,782
4,797,783
395 4,797,784
402 4,797,785
419 4,797,786
421 4,797,787
436 Re.32,829
525 4,797,789
540 4,797,788
CLASS 362
61 4,797,790
72 4,797,791
83 4,797,792
105 4,797,793
199 4,797,796
226 4,797,794
233 4,797,795
348 4,797,797
413 4,797,798
CLASS 363
37 4,797,799
4,797,800
43 4,797,801
87 4,797,802
95 4,797,803
CLASS 364
200 4,797,808
4,797,809
4,797,810
4,797,811
4,797,812
4,797,813
4,797,814
4,797,815
4,797,816
4,797,817
401 4,797,818
403 4,797,819
420 4,797,820
422 4,797,821
4,797,822
424.05 4,797,823
4,797,824
426.02 4,797,825
426.04 4,797,826
431.03 4,797,827
431.04 4,797,828
434 4,797,829
464.03 4,797,830
474.07 4,797,831
478 4,797,832
481 4,797,805
483 4,797,833
510 4,797,834
513 4,797,835
518 4,797,836
519 4,797,837
551.01 4,797,838
554 4,797,839
557 4,797,840
571.04 4,797,841
578 4,797,842
713 4,797,843
724.01 4,797,844
724.07 4,797,807
724.1 4,797,845
724.17 4,797,846
725 4,797,847
754 4,797,848
765 4,797,849
900 4,797,806
4,797,850
4,797,851
4,797,852
4,797,853
4,797,854
4,797,855
CLASS 365
154 4,797,804
185 4,797,856
189 4,797,001
203 4,797,857
230 4,797,858
CLASS 366
25 4,797,002
101 4,797,003
186 4,797,004
343 4,797,005
CLASS 367
31 4,797,859
47 4,797,860
50 4,797,861
143 4,797,862
157 4,797,863
CLASS 368
111 4,797,864
CLASS 369
39 4,797,865
43 4,797,866
44 4,797,868
45 4,797,867
75.2 4,797,869
100 4,797,870
4,797,871
109 4,797,872
270 4,797,873
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27 : 4,796,373
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28 : 4,797,026
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29 : 4,796,363
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33 : 4,796,766
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34 : Re.32,826
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35 : 4,796,478
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36 : Re.32,825
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41 : Re.32,822
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44 : 4,796,443
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45 : 4,796,315
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48 : 4,796,357

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49 : 4,796,881
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50 : 4,796,602
4,796,910
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51 : Re.32,824
4,796,573
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4,797,670
53 : 4,796,382
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4,797,089
4,797,095
4,797,155
4,797,635
4,797,660
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4,797,843
4,797,863
54 : 4,796,768
4,797,501
55 : Re.32,823
4,796,310
4,796,410
4,796,511
4,796,814
4,796,887
4,797,171
4,797,221
4,797,798

DESIGN PATENTS

04	:	299,305			299,353	17	:	299,289		299,335	
05	:	299,285			299,366			299,368		299,337	
		299,307			299,373	18	:	299,321		299,338	
06	:	299,282	08	:	299,290	22	:	299,339	33	: 299,352	
		299,286			299,376	25	:	299,284	34	: 299,297	
		299,287	12	:	299,303			299,316		299,313	
		299,296			299,311			299,347	36	: 299,281	
		299,302			299,317			299,349	39	: 299,374	
		299,308			299,341	26	:	299,280		299,288	
		299,318			299,345			299,309		299,327	
		299,326			299,362			299,312		299,328	
		299,344			299,370	27	:	299,301		299,329	

		299,330	48	:	299,314						
		299,331			299,363						
		299,346			299,364						
		299,356			299,372						
		299,359			299,377						
		299,378	51	:	299,365						
40	:	299,350	53	:	299,300						
		299,351			299,369						
41	:	299,283			299,379						
42	:	299,293	55	:	299,360						
		299,294			299,361						
47	:	299,375									

PLANT PATENTS

06	:	6,518	34	:	6,517						
12	:	6,529	41	:	6,520						
		6,521			6,522			6,523	53	:	6,528

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